

British Guiana.

ADMINISTRATION REPORT
OF THE
DIRECTOR OF AGRICULTURE
FOR THE YEAR
1937.

GEORGETOWN, DEMERARA:
PRINTERS TO THE GOVERNMENT OF BRITISH GUIANA.
"THE ARGOSY" COMPANY, LIMITED.
1938.

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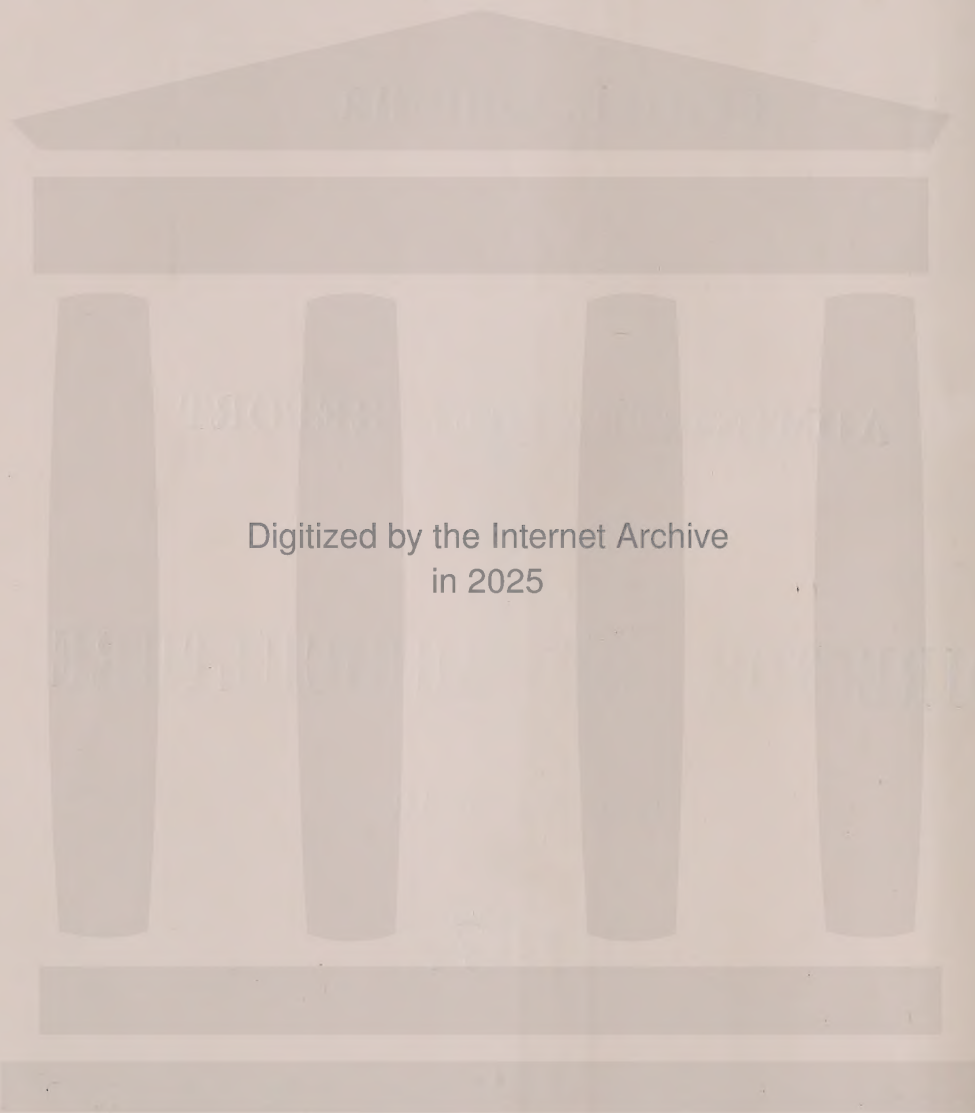
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DEPARTMENT OF AGRICULTURE.

ADMINISTRATION REPORT OF THE DIRECTOR OF AGRICULTURE FOR 1937.

SECTION I.

AGRICULTURE IN THE COLONY.

General.

The year under review has been the best the Colony has experienced since 1928, judged on the total value of agricultural exports. Exports of sugar including the carry over from 1936 were the highest on record—181,574 tons—and the value in spite of low prices, amounted to \$7,608,106. By-products bring the aggregate up to \$8,456,279. In 1928 the value of the 114,687 tons exported and by-products was \$8,895,454. Prices fell from \$71 per ton in 1928 to \$41.9 per ton in 1937. This price fall serves to emphasise the importance of the increased yield of sugar per acre in recent years. The usual tendency is to judge an industry in terms of export values without adequate regard to other considerations. With the increased production noted, labour has reaped proportionate advantages, especially through the distribution of earnings which, in turn, has reflected advantageously on trade conditions generally. From the sociological standpoint such repercussions may be equally as valuable to a community as actual exports, particularly during a period of unstable economic conditions and when population is increasing at an appreciable rate as is the case locally. Cane-farming also has expanded from small beginnings to over 4,000 tons in each of the last two years. At the basic minimum price paid for cane by the factories this means that over \$100,000 went directly into the pockets of cane-farmers during 1937.

2. Exports of rice, the next most important industry, have not climbed back to the record established in 1933 due largely to unfavourable seasons and a lower price level, but annual consumption has substantially increased and is now about 24,000 tons annually. Based on export prices for 1937 this would be valued at \$1,000,800 and, together with actual exports for the year represented a total value to the Colony of \$1,784,338. It may be noted that the value per ton of rice in 1928 was \$61.6, in 1937 \$41.7.

3. A short term crop such as rice usually reacts at once to a reduction in price and production suffers accordingly, until cultivators have accustomed themselves to the new price level. With restriction in sugar production, unemployed labour might with advantage devote more attention to this crop. Meantime, the Sugar Restriction Agreement has served to focus attention on the urgent needs of the rice industry ;—

- (1) Adequate drainage and irrigation in certain districts not now provided with such facilities ;
- (2) Improvement of conditions on the Essequibo Coast, one of the best districts for rice cultivation in the Colony ;
- (3) Improvement of milling.

4. The first is self-explanatory. In the case of the second, with the gradual disappearance of sugar from the Coast, rice production assumed the status of a staple industry. Conditions were satisfactory for some years owing to good prices for rice and padi—in fact so long as the price of padi was between \$1.50 and \$2.00 per bag of 150 lb. there was no cause for anxiety and those engaged in the industry appeared to be fairly well off. However, with the fall in price to \$1.00 per bag (in some years less) and with no other employment between rice crops, economic conditions have gone from bad to worse. There has been a substantial decline in

production on the Coast owing to the more able-bodied leaving in search of employment on sugar estates in other parts of the Colony, and also as a result of the system of annual double cropping to rice which does not permit of the fields being suitably rested. The fields are more or less under water all the year round, thus rendering efficient cultivation difficult. A scheme has been worked out having for its object the resting each year of a part of the rice area which can be used for stock raising, but this is not likely to be adopted in practice until drainage, irrigation and cultivation have all been brought under some reasonable method of control with more centralized milling. The Essequibo Coast Commission report (Sessional Paper No. 16/35) fully discussed the economic position on the Coast as a result of the change over from sugar to rice.

5. In regard to the third requirement, it has been felt for some time that improvement in handling and processing padi at the mills is a prime requisite, and on the satisfactory solution of this problem depends to a great extent the future of the export trade. The necessity for a reduction, wherever possible, of the numerous small primitive mills in operation, and consolidation into larger and more efficient units is becoming increasingly evident. The full benefits of the pure line work of the Department cannot be realized until milling conditions improve.

6. Exports of coconuts and by-products show an increase on the previous year while there is also a slight increase in Liberian coffee, although the condition of the latter industry is still very unsatisfactory, and growers may have to look more and more to the highly protected local market. A Select Committee of the Legislative Council has been appointed to consider ways and means of assisting the coffee industry in view of its importance on the riparian pegasse lands where there is no likelihood of a substitute being found. Towards the end of the year plans were made for a visit to Surinam of the Director of Agriculture, who is Chairman of the Select Committee and the Hon. C. R. Jacob, a member, with a view to studying conditions in the industry there and the methods of assistance provided through the Central Coffee Board.

7. The question of minor industries has been receiving careful and sustained attention. Much of the time of the meetings of the Board of Agriculture during last year has been occupied with this question, especially the plantain situation and with efforts to organise the trade, notably with Trinidad, which has been gradually going more and more to Venezuela, largely as a result of their close proximity to each other coupled with easy transport facilities. Unfortunately, no trade agreement could be arrived at which would enable cultivations to be extended and the trade organised to ensure regular supplies going forward. Exportation is still, of course, carried on in a small way by speculators. The situation is more fully explained in paragraph 46. Ground provision and vegetable cultivation (including plantains) shows a small increase over last year but it must be remembered that absorption of surplus production of foodstuffs of this type depends on the existence of industrial centres, and in this Colony there are few other than sugar. While there are still many commodities imported and which efforts are being made to produce, there is no shortage locally of foods such as vegetables, rice, fish and meat, although an important article such as milk needs better organisation both in regard to supply and distribution. Higher labour costs and insufficient use of family help often make it difficult for the locally produced article to compete with imports from countries of lower standards or with those resulting from large scale output, *e.g.*, split peas and beans. The same applies equally to production for export of a number of minor products.

8. The extension in recent years of improved varieties of fruit has begun to make an impression on the local market and it is now possible to obtain, in season, quantities of locally grown grapefruit and oranges of good quality. One of the difficulties is that low prices frequently result due to competition from imported fruit, usually from Trinidad. What is required is a carefully worked out plan which

takes into consideration seasons and which will permit of a suitable trade agreement between the various Colonies so as to allow of entry of imported fruit or vegetables only when there is a scarcity of home grown. In this way producers would be assured of fair prices. This question was brought up at the recent W.I. Fruit and Vegetable Council (1938) and further reference will be made to it in due course as soon as the necessary preliminary investigations have been carried out.

9. As a result of increased consumption of local cigarettes—there are now two factories engaged in their manufacture mainly from imported leaf—attention has been drawn to the possibility of a minor industry for the production of flue-cured tobacco to meet part of the requirements of these concerns. Preliminary trials with flue-curing have been undertaken by the Department with encouraging results and the project is being examined with a view to further developments.

10. Honey is one of the more promising of the minor products and, at the end of the year, an effort was being made for a first trial shipment. Although domestic consumption has increased markedly during recent years, through sustained advertising, production has nevertheless moved ahead somewhat faster. For these reasons it is hoped that, in the near future, the Colony will take its place in the export market.

11. A free grant of £3,000 was received from the Colonial Development Fund to provide for the improvement of the breed of beef cattle on the coastal areas. In this connection, one of the recommendations of the Essequibo Coast Commission was the establishment of an agistment area at La Belle Alliance. This project together with extension of the Georgetown unit and the establishment of a small breeding centre at Whim, Corentyne, are being met from this grant. Meantime the regular monthly call at Berbice of a small Dutch steamer has stimulated shipments of coastal cattle, poultry and eggs from the Corentyne Coast to Trinidad. These developments will be watched and fostered in every way possible.

Weather Conditions.

12. Details of the meteorological data obtained during the year are to be found in the annual meteorological report of the Department. To the non-agricultural section of the population, the most noticeable feature of the year was the unusually hot weather experienced on the coast in September and October, although these are usually the hottest months. The factor in local weather conditions, however, which chiefly concerns the planter and farmer is rainfall, and it is this factor which varies most from year to year. It is not so much the total rainfall that matters as the distribution. The total precipitation for the year as Table I shows, was not far from the average, though slightly above it, but the very low rainfall of February and March—less than an inch on the Coast, in Berbice and Demerara—was a severe handicap to the sugar and the rice spring crop. Subsequently, the mid-year rains of June and July were abnormally heavy and the November rainfall also was rather above the average, factors again prejudicial to the planters.

13. Table I shows the mean rainfall for 1937 in the coastal area of the three counties, compared with the average rainfall for the period 1928–1937 inclusive

TABLE I.
MEAN RAINFALL AT COASTAL STATIONS.

Months.	Berbice.		Demerara.		Essequibo.	
	1937. Inches.	1928-1937. Inches.	1937. Inches.	1928-1937. Inches.	1937. Inches.	1928-1937. Inches.
January ...	7.09	8.08	12.73	10.59	13.61	10.18
February ...	.72	4.44	.75	4.25	1.32	4.56
March ...	2.06	5.11	1.36	4.42	1.51	3.71
April ...	7.02	7.21	5.29	6.90	5.79	5.77
May ...	13.47	11.16	12.98	12.06	13.57	12.89
June ...	20.63	12.36	18.37	14.15	14.72	13.27
July ...	12.39	10.76	14.18	11.62	15.29	12.33
August ...	4.61	5.71	7.28	6.57	8.39	6.59
September ...	1.15	2.43	3.05	2.73	5.31	3.69
October ...	2.16	2.51	2.86	3.53	2.34	4.47
November ...	4.17	3.45	4.43	4.41	7.15	5.68
December ...	8.56	9.06	10.80	10.96	9.66	11.53
Total ...	84.03	82.28	94.08	92.19	98.66	94.67

AGRICULTURAL INDUSTRIES.

Sugar.

14. The annual export statistics covering the sugar industry for the ten years ending 1937 are shown in Table III, while Table II records the acreage reaped, sugar production, yield per acre and rum produced for the period 1932-1937.

TABLE II.

CANE ACREAGES REAPED, PRODUCTION OF SUGAR, YIELD PER ACRE, AND RUM PRODUCED IN BERBICE DEMERARA AND BRITISH GUIANA FOR 1932-1937.

Year.	Area Reaped (inclusive of farmers' canes)—English Acres.			Sugar Produced (inclusive of Farmers' canes) — tons.			Yield per acre — tons.			Rum Produced—Proof Gallons.		
	Berbice.	Demerara.	Total: Colony.	Berbice.	Demerara.	Total: Colony.	Berbice.	Demerara.	Total: Colony.	Berbice.	Demerara.	Total: Colony.
1932	20,578	33,641	55,240	62,856	83,667	148,634	3.05	2.49	2.69	221,639	558,667	811,650
1933	21,241	33,711	55,811	60,540	80,116	141,956	2.85	2.38	2.54	385,495	821,465	1,239,355
1934	21,663	31,930	53,966	60,675	71,172	132,240	2.80	2.23	2.45	413,773	913,252	1,346,307
1935	22,769	36,637	59,932	75,963	101,273	178,041	3.34	2.79	2.97	669,671	1,073,537	1,775,382
1936	23,702	39,311	63,385	78,831	116,815	195,944	3.33	2.97	3.09	666,280	1,147,301	1,819,581
1937	24,597	40,293	64,890	77,012	109,863	186,875	3.13	2.73	2.88	743,860	1,144,471	1,888,381

TABLE III.

EXPORTS OF SUGAR, RUM, MOLASSES AND MOLASCUIT — 1923-1937.

Year.	Sugar.			Rum.		Molasses.		Molasquit.	
	Tons.	Value in \$	Value per ton in \$	Proof Gallons.	Value in \$	Gallons.	Value in \$	Tons.	Value in \$
1928	114,687	8,124,666	71.0	1,269,923	576,287	2,873,468	164,231	1,832	30,220
1929	100,449	5,943,788	59.1	1,109,482	491,476	2,536,623	141,203	1,803	27,209
1930	114,542	5,418,884	47.3	846,319	362,970	3,851,837	198,454	400	5,768
1931	119,346	5,325,755	44.6	722,076	233,644	7,106,997	369,338	66	945
1932	137,078	6,442,515	47.0	645,511	236,760	7,554,520	387,794	265	2,952
1933	127,083	5,745,151	44.9	883,019	383,262	8,137,233	421,706	178	2,796
1934	129,913	5,568,454	42.8	1,120,090	486,425	5,384,834	278,354	...	...
1935	174,156	6,926,439	39.7	1,073,405	422,660	5,949,393	307,931	205	3,444
1936	176,505	6,853,058	38.8	1,444,877	636,351	8,168,250	419,712	382	6,426
1937	181,574	7,608,105	41.9	1,218,598	543,241	5,776,864	297,226	459	7,706

15. The average f.o.b. price received for 96° sugar during the year as supplied to the Customs Department by the sugar exporters was \$41.9 per ton. At the beginning of the year the United Kingdom market opened with a good volume of business because there was a general anticipation of a rise in sugar prices. Several reasons were responsible for this forecast—the much discussed policy of Government to put in stocks against a war eventuality, the reports from Cuba of a smaller crop than was estimated and the anticipation of the results of the International Sugar Conference. In the latter part of the year, however, there was a gradual

decline in price which was to some extent attributed to stocks that were reported to be mounting and the prospects of a good European sugar-beet crop. The decline in price, which was felt in British Guiana as elsewhere, was all the more unfortunate because of the restriction in output and a sharp rise in freight rates.

16. The sugar crop for 1937 amounted to 186,875 tons, a decrease on the record output of 195,944 tons in 1936, but is the second highest on record. Of the 70,233 acres under cane, 64,890 acres were reaped during the year, 62,806 on the sugar estates and 1,984 from farmers' canes. The average yield of sugar per English acre for estates, including the less efficient, suffered a reduction from 3.13 tons in 1936 to 2.91 in 1937. This was due to the less favourable weather conditions in the earlier part of the year and a change in field policy which had to be undertaken in view of the coming into force, in the latter part of the year, of the sugar restriction agreement.

17. The total rainfall for the year as already stated exceeded the average. Excesses occurred in the normally well-watered months of January, June and July ; on the other hand, the spring dry season was accentuated by a severe shortage of rain in February and March, and November was also drier than usual.

18. The reduction of the Colony's future export of sugar to a basic figure of 164,145 tons as a contribution to the general agreement means, in practice, a reduction of 12 per cent. of the total production of recent years and this, of course, must affect employment adversely ; labour non-resident on the estates will be the hardest hit. Further, two of the smaller and less efficient estates which have been gradually reducing operations are expected to go out of cultivation entirely by the end of 1938.

19. Statistics, kindly supplied by the sugar estates, show that the old variety D. 625, is being rapidly supplanted by the varieties Diamond 10 and P.O.J. 2878, and now occupies only about 20 per cent. of the cane area of the Colony compared with 90 per cent. a few years ago. P.O.J. 2878 has shown itself well suited to the conditions of the Colony. Tolerant to both flood and drought conditions, with strong ratooning qualities and ability to produce quick cover, its performance in the field is steadily placing it above all other varieties in popularity. Diamond 10 continues to be popular, especially on the higher lands of the Demerara River areas.

20. Table IV shows the areas under these three varieties from 1933-1938.

TABLE IV.

AREAS UNDER D. 625, DIAMOND 10 AND P.O.J. 2878.

Year.	Variety.		
	D. 625 acres.	Diamond 10. acres.	P.O.J. 2878. acres.
1933	32,964	5,563	...
1934	32,703	8,796	746
1935	32,429	13,303	2,763
1936	28,552	18,850	6,214
1937	21,380	23,700	12,427
1938	13,141	26,356	20,223

21. *Cane-farming.*—This industry is of considerable importance to the villagers on the East Coast of Demerara. Farmers are being encouraged to change over from the variety D. 625 to P.O.J. 2878 and Diamond 10 and a total of 20,150 cuttings of these two varieties were distributed by the Department to farmers in Plaisance and Beterverwagting during the year. There are complaints from time to time over prices paid for cane, but having regard to sugar prices, the quality of farmers' canes and the various concessions allowed by the factories, the price may be considered fair and reasonable. A factor in the low price complaint which the farmers do not always realise is that yields from their cultivations could be substantially

increased if their fields were rested and flood-fallowed, and more fertilisers applied, especially to the ratoons. These points are being emphasised in meetings with the farmers. The output of sugar from farmers' canes during the past seven years is given below :—

1930	...	...	1,625 tons.
1931	...	...	1,631 "
1932	...	...	2,047 "
1933	...	...	2,328 "
1934	...	...	2,122 "
1935	...	...	3,344 "
1936	...	...	4,115 "
1937	...	...	4,112 "

Rice.

22. The area occupied by rice during 1937 was 60,079 acres but, including the spring crop, the area actually reaped was 70,787 acres. The yield was returned at 73,769 tons padi, which is equivalent to 44,261 tons rice. The amount of rice exported was 18,795 tons with a value of \$783,538 as against 20,559 tons with a value of \$810,318 for 1936.

23. The shortage of supplies which occurred prior to the reaping of the 1936 autumn crop (for export in 1937) encouraged buyers to pay higher prices for padi than had been the case in previous years. The crop was reaped under good weather conditions and considerable forward sales were made at fairly good prices which were based on the opening price of 10/6 per cwt. for Burma new crop rice. A fall in the price of Burma rice as against the higher prices demanded locally made the cancellations of some forward sales mutually agreeable to overseas buyers and exporters.

24. Table V gives particulars of rice acreages, production and exports from 1928-1937.

TABLE V.
RICE ACREAGES, PRODUCTION AND EXPORTS, 1928-1937.

Year.	Area Reaped (Spring and Autumn Crops) English Acres.					Yields.		Exports.		
	Berbice.	Demerara.	Essequibo.		British Guiana total acreage (reaped).	Padi tons.	Rice tons (60% yield of cleaned Rice from Padi)	Rice.		
			Mainland	Islands				Tons.	Total Value in dollars.	Value per ton in dollars.
1928	22,028	17,886	12,356	6,182	58,452	61,144	36,686	18,083	1,114,147	61·6
1929	28,121	20,962	11,023	6,636	66,742	72,096	43,257	14,091	876,407	62·1
1930	26,689	18,399	10,786	7,608	63,482	64,252	38,551	22,480	1,090,385	48·5
1931	29,217	34,955	10,445	8,875	83,492	78,424	47,054	23,632	1,060,339	44·8
1932	29,218	37,275	12,556	8,892	87,941	84,783	50,869	28,541	1,187,871	41·2
1933	27,120	37,696	13,197	9,112	87,125	63,524	33,154	29,120	1,062,470	36·4
1934	24,990	31,213	6,638	8,110	70,951	55,112	31,067	14,700	583,090	39·6
1935	32,971	32,713	10,054	7,828	83,566	85,522	51,313	10,565	473,086	44·7
1936	23,125	21,086	10,564	8,081	62,856	60,580	36,348	20,559	810,318	39·4
1937	28,189	24,023	8,866	9,709	70,787	73,769	44,261	18,795	783,538	41·7

25. It will be appreciated that these figures are approximations, it being extremely difficult to secure accurate figures for a crop cultivated under such varying conditions and subject to so many risks of one kind or another.

26. The total acreage reaped this year was an improvement on the previous year, when excessive rainfall at one period and prolonged dry weather at another caused a reduction, but it was nevertheless below the average for the period 1931-1935. Unfavourable weather together with low prices in recent years are responsible for the decrease, but extension of cane-farming in certain large village areas has to some extent compensated for this reduction. Rice is the principal article of diet of the working classes and it should be noted that local consumption is increasing, being estimated now at 24,000 tons annually. As stated previously, this is often overlooked in estimating the true value and importance of the industry to the Colony.

27. As already mentioned a solution of the milling problem is urgent. Under existing conditions, processing is severely handicapped during dull and showery weather and this not only reacts unfavourably on quality of the final product but jeopardises deliveries at shipping points. With assured supplies of more uniform grades from Burma, the tendency has been for Caribbean markets to look more and more to that country for shipments and this practice is not likely to diminish until our production increases and conditions of handling improve. This points to the necessity for a reduction wherever possible of the numerous small mills in operation and a consolidation into large and more efficient units.

28. The Committee appointed by Government to consider the future of the industry concluded their sitting, the report has since been published as Sessional Paper No. 1/38 and is receiving attention. The main recommendations are:—

- (1) That control of exports should continue but the present Rice Marketing Board be replaced by a "Rice Producers' and Brokers' Association."
- (2) That grading of rice should remain compulsory.
- (3) That the administration of the Rice Factories' Ordinance be placed in the hands of the Department of Agriculture, and that the requirements of the Ordinance in respect of statistical information be strictly enforced.
- (4) That Government should investigate the possibility of introducing compulsory measures to ensure that only approved types and qualities of padi are planted.
- (5) That Government should take immediate steps to investigate whether the construction and maintenance of irrigation and drainage schemes in selected areas should be financed by means of a cess.
- (6) That experiments be carried out on the mechanisation of the means of production under the supervision of Government and that persons using gasoline driven tractors in the cultivation of padi should be granted a drawback of the entire duty.
- (7) That an Agricultural Loan Bank should be established.
- (8) That reduction in the number of mills should be investigated, that is, an investigation into the possibility of providing funds for the purchase of factories at present in existence which are not equipped to a minimum standard at a given date, and that legislation should be introduced to prohibit the erection of new factories not so equipped.

29. It should be added that there is considerable controversy among rice interests over the first recommendation which will make it difficult of adoption at the present juncture. The general feeling is in favour of little or no control, until increased production and milling improvements are assured.

30. Table VI gives particulars of rice exported during 1937 according to grade.

TABLE VI.
RICE GRADED FOR 1937.

Months.	W. G. Super. Bags.	Super. Bags.	No. 1 Extra. Bags.	No. 1. Bags.	No. 2. Bags.	No. 3. Bags.	White Rice.		Super Broken. Bags.	Broken. Bags.	Total. Bags.
							A. Bags.	B. Bags.			
January	15	3,478	960	4,180	7,598	5,972	57	33	66	228	22,587
February	...	4,169	844	5,981	8,349	5,932	187	451	61	195	26,169
March	...	4,304	831	5,443	10,473	7,866	146	264	122	149	29,613
April	...	2,510	586	2,969	10,730	3,700	173	78	124	135	21,005
May	...	2,746	423	1,490	7,787	3,913	123	30	67	12	16,541
June	...	2,554	970	1,486	5,762	4,869	106	26	65	18	15,856
July	...	2,807	1,177	683	5,226	5,461	2	7	25	3	15,391
August	...	1,944	548	848	4,830	3,574	5	4	25	10	11,738
September	...	1,134	421	460	4,009	5,391	...	...	8	...	11,415
October	...	3,480	778	3,466	7,257	6,310	3	7	66	10	21,349
November	...	5,332	693	3,882	14,052	4,653	224	31	66	20	28,956
December	...	2,680	1,718	3,326	13,202	4,133	65	15	218	133	25,495
Total	15	37,138	9,949	34,214	99,255	61,794	1,091	949	847	918	246,170*

* Equivalent to 18,795 tons.

Coconuts and Copra.

31. The area under coconuts in 1937 was 21,600 acres. The exports for 1937 were as follows :—Coconuts, 1,968,665 valued at \$30,511 ; Copra, 716 tons valued at \$71,903 ; Coconut oil, 13,640 gallons valued at \$7,456.

32. The production of copra in 1937 showed an increase, brokers receiving a total of 2,152 tons for the year compared with 1,869 tons during 1936. 716 tons were exported whilst the balance was purchased by the local oil mills.

33. Brokers distributed the net proceeds of sales at the following rates :—

March quarter	...	...	3.40
June	"	...	2.86
September	"	...	2.68
December	"	...	2.35

The gradual decline reflects the fall in export values which at the beginning of the year stood at over £20 per ton but receded throughout the year falling to £12 per ton during the last quarter.

34. The Coconut Products (Control) Ordinance although not working as satisfactorily as it might has benefited producers considerably.

35. Table VII gives particulars of approximate acreage, and exports of coconuts and by-products for the period 1928-1937.

TABLE VII.

COCONUT ACREAGES, AND THE PRODUCTION AND EXPORTS OF COCONUTS AND ITS BY-PRODUCTS—1928-1937.

Year.	Acres under cultivation (English) acres.	No. of Nuts Exported.	Value in Dollars.	Copra Exported, tons.	Value in Dollars.	Coconut Oil Exported gallons.	Value in Dollars.
1928	...	29,456	321,635	5,939	3,501	352,522	26,244
1929	...	29,456	637,812	10,614	3,759	314,350	20,862
1930	...	28,052	629,371	7,845	2,010	143,423	26,377
1931	...	22,882	1,494,195	13,538	1,381	82,629	20,742
1932	...	23,301	962,364	10,484	757	48,936	19,048
1933	...	23,452	1,698,175	22,925	921	41,045	20,198
1934	...	22,600	2,487,402	32,960	700	23,487	12,662
1935	...	21,786	2,737,784	33,891	1,226	55,134	6,699
1936	...	21,379	1,914,169	24,755	563	37,051	9,818
1937	...	21,600	1,968,665	30,511	716	71,903	13,640

Coffee.

36. The area under coffee in 1937 was 4,354 acres made up as follows :—

Under cultivation	...	...	2,427 $\frac{3}{4}$ acres
Semi-abandoned	...	...	1,383 $\frac{1}{4}$ "
Old and abandoned	...	...	543 "

37. The exports were 201 tons of cured coffee valued at \$22,902. At one time the Scandinavian countries absorbed most of the coffee produced in the Colony. On account of the system of barter which has sprung up between Norway and Brazil resulting in exchange of fish for coffee together with the continued increase in production of better grade coffees and the consequent fall in prices, Liberian coffee has not only reached a stage where it is unprofitable to cultivate but also increasingly difficult to dispose of. More than half of the exports in 1937 went to Canada and the British West Indies, the former being the larger importer.

38. Liberian coffee is practically the only type produced commercially and the crop is of great economic importance on the river pegasse areas of the Colony. Prices continued at a level so low as to offer little encouragement to growers to perform any cultural operations. The neglect of cultivations has resulted in an appreciable decline in production in recent years.

39. Reference has already been made to the appointment of a Select Coffee Committee of the Legislative Council to advise whether any financial assistance should be given to this industry and if so, what form such assistance should take.

40. Table VIII shows the approximate acreage, exports and values of this crop during the period 1928-1937.

TABLE VIII.
COFFEE ACREAGES, EXPORTS AND VALUES—1928-1937.

Year.	Area cultivated (English) acres.	EXPORTS.	
		Tons.	Total Value in Dollars.
1928	6,201	410	137,533
1929	6,212	405	104,135
1930	5,363	164	22,400
1931	4,899	355	33,582
1932	5,800	470	69,436
1933	4,630	510	79,594
1934	4,217	317	47,238
1935	4,051	210	23,849
1936	3,512	167	15,626
1937	*3,811	201	22,902

* Exclusive of old and abandoned coffee.

Citrus.

41. The area under citrus and other fruit was 518 acres exclusive of limes. A number of the budded trees of improved citrus varieties supplied by the Department in recent years have now begun to come into bearing, but as a rule the trees do not receive the attention which they should.

42. The area under limes was 836 acres. The exports of concentrated lime juice for the year were 5,507 gallons valued at \$1,576 as against 9,825 gallons with a value of \$2,422 in 1936, and 700 gallons of essential oil of limes valued at \$26,071 as compared with 732 gallons valued at \$28,569 in 1936.

43. In addition to lime oil, the possibilities of profitable marketing of green limes and raw lime juice were explored, and trial shipments of both were sent to Montreal. The limes, which were obtained from the North West District, were packed in twelve lugs containing fruit of varying size; and the juice samples which came from the same source, were bottled. The samples of juice proved unsatisfactory. The limes, however, arrived in good condition but were reported on as being of larger size than usually shipped and rather rough in comparison with the usual shipments from the West Indies; they also arrived late in the season, as in the North West District the lime crop is at its best somewhat after the period of maximum green lime sales in Canada—which is during June and July. Finally, the prices obtained, though showing a small profit, were not such as to encourage the shipper in the North West District in view of freight charges to town, costs of packing and handling, and difficulties of transshipment in Georgetown. Competition will be severe with Colonies more favourably situated, but it is intended, nevertheless, to make a further trial with such limes as are available earlier in the year, when prices should be better.

44. Table IX gives statistics bearing on the citrus industry from 1928-1937. The acreages are approximations only as it is difficult to assess the status of these cultivations under local conditions with any degree of accuracy.

TABLE IX.

CITRUS ACREAGES, EXPORTS AND VALUES OF CONCENTRATED LIME JUICE AND ESSENTIAL OIL OF LIMES—1928-1937.

Year.	Limes (English) acres.	Other Citrus and Fruit (English) acres.	Concentrated Lime-juice Exported. Gallons.	Value in Dollars.	Essential Oil of Limes Exported Gallons.	Value in Dollars.
1928	695	...	8,124	7,799	440	26,316
1929	635	...	12,717	12,019	801	47,585
1930	740	...	11,373	10,855	660	38,352
1931	747	254	8,347	8,014	590	39,806
1932	787	316	958	920	730	44,728
1933	869	328	Nil	...	1,166	65,014
1934	789	371	10,468	2,013	892	32,967
1935	694	656	3,112	689	597	25,092
1936	698	657	9,825	2,422	732	28,569
1937	836	518	5,507	1,576	700	26,071

Vegetable Crops.

45. The area under ground provisions was 12,925 acres as against 11,359 acres in 1936. Small increases are recorded in all three counties. The area varies from year to year depending on weather and market conditions and on the amount of wage-earning employment available.

46. The question of the stabilisation of the plantain export trade with Trinidad received the close attention of the Department and the Advisory Board of Agriculture during the year, but it has not been possible to affect any change in the situation. The proposals which have been put forward for the development of the trade with Trinidad are contingent on the Government of Trinidad being willing to take measures which would enable plantains from this Colony being given substantial preference in Trinidad over the Venezuelan article either through the Customs tariff or by the granting of a quota. Proximity of Venezuela to Trinidad ensures easy transport and allows plantains to be carried, stripped from the bunch, in open boats, without any packing. Locally, there is transport of the bunches from the fields in small boats, then in carts or lorries to Georgetown, where the bunches are divided up and packed in empty cod fish casks holding about ten bunches each, with further handling from ship to shore on arrival in Trinidad.

47. The Department's seed supply and demonstration stations continue to be of assistance in the cultivation of green vegetables. Further reference to this is made in paragraphs 149-151. Soil and weather conditions are not generally favourable to success with the more exacting types, but there are greater possibilities on the sand reefs, providing animal manure is incorporated in the soil and water is available during periods of dry weather. The average local farmer does not take kindly to such intensive methods.

Cacao.

48. The area under cacao was returned at 422 acres. The main decreases are recorded in Berbice and Demerara, especially in the West Demerara District where cultivations have had to fight against Witch Broom disease and neglect. In the North West District, however, where Witch Broom is not yet known to occur, a number of additional plantings have been made and the prices obtained in the local market (16 cents per lb. and upwards for cured cocoa) prove remunerative. As long as a demand exists, this crop is a useful one for the small farmer where conditions enable it to be grown successfully. If the dried powder could be put on the local market in addition to the preparations of chocolate for which the cacao is used at present, it would afford a further outlet for this crop.

49. Table X shows the area under cultivation and the imports of raw cacao and prepared cacao from 1928-1937.

TABLE X.

CACAO ACREAGES, IMPORTS AND VALUES OF RAW CACAO AND PREPARED CACAO—1928-1937.

Year.	Area cultivated (English) acres.	Cacao exported. lb.	Cacao—Imports.			
			Raw Cacao. lb.	Value in Dollars.	Prepared Ground. lb.	Value in Dollars.
1928	1,265	none	3,367	423	150,393	27,404
1929	1,514	"	4,834	539	119,134	19,722
1930	1,514	"	6,201	637	108,081	18,108
1931	953	"	9,624	800	121,961	18,250
1932	791	"	1,147	87	70,764	12,139
1933	797	"	163	18	109,092	15,187
1934	812	787	3,832	279	106,201	16,033
1935	843	none	4,166	273	115,746	16,930
1936	512	"	30	2	101,261	14,254
1937	422	"	40	2	128,876	21,778

Census Returns.

50. From Table XI it will be seen that there has been an increase over 1936 in the total acreage devoted to agriculture. The main factors responsible for the variation from year to year were referred to at some length in last year's report. Briefly, the farmer is not tied to his land in the same way as is possible in most Colonies and prefers casual employment when such is available. The drainage problem, associated with the low lying nature of the land, is ever present.

51. Tables XI and XII show the number of acres under cultivation in the three counties during 1937 and summaries for the period 1928-1937 respectively.

TABLE XI.

CROP ACREAGES IN BERBICE, DEMERARA AND ESSEQUIBO COUNTIES, 1937.

Counties.	Nature of Crops and number of Acres under cultivation on December 31, 1937. (English acres).								
	Sugar Cane.	Rice.	Coconuts.	Coffee.	Cacao.	Rubber.	Limes.	Other Citrus and Fruit.	Ground Provisions.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
Berbice	27,038	28,189	3,759	...	112	...	608	154	3,628
Demerara	43,195	20,768	12,143	1,332	119	75	...	245	6,750
Essequibo	...	11,122	5,698	2,479	191	44	228	118	2,548
Total	70,233*	60,079†	21,600	3,811‡	422	119	836	517	12,926

* Includes area under farmers' canes—2,678 acres.

† Does not include acreage for the Spring Crop—10,708 acres—which is grown on the same land.

‡ Exclusive of old abandoned coffee.

TABLE XII.

SUMMARIES OF CROP ACREAGES—1928-1937.

Year.		Annual Summaries of the acreages under cultivation during the years 1928-1937 together with the acreages reaped for the same period for sugar-cane and rice. (English acres).											
		Sugar-Cane.		Rice.		Coconuts.	Coffee.	Cacao.	Rubber.	Limes.	Other Citrus and Fruit.	Maize, Plan- tains, etc., and Ground Provisions.	Total area under cul- tivation.
		Area culti- vated.	Area reaped.	Area culti- vated.	Area reaped.								
British Guiana	1928	57,625	53,489	46,667	58,442	29,456	6,201	1,265	1,683	695	...	16,336	159,928
Do.	1929	57,247	56,126	53,745	66,742	29,456	6,212	1,514	1,474	635	...	14,283	166,566
Do.	1930	57,244	54,264	52,287	63,482	28,052	5,363	1,514	1,474	740	...	14,312	160,986
Do.	1931	61,097	54,999	77,478	83,492	22,882	4,899	953	827	747	254	17,575	186,712
Do.	1932	62,905	55,240	73,453	87,941	23,301	5,800	791	880	787	316	17,135	185,368
Do.	1933	63,093	55,811	72,161	87,125	23,452	4,630	797	681	869	328	16,635	182,646
Do.	1934	61,567	53,966	63,227	70,951	22,600	4,217	812	873	789	371	16,450	169,906
Do.	1935	67,914	59,932	70,882	83,566	21,786	4,051	843	679	694	656	13,246	178,544
Do.	1936	69,235	63,385	51,041	62,856	21,379	3,512	512	133	698	657	11,359	158,526
Do.	1937	70,233	64,890	60,079	70,787	21,600	3,811*	422	119	836	517	12,926	170,723

* Exclusive of old abandoned coffee.

Livestock.

52. There is no material change to report in the methods of animal husbandry which are for the most part extensive rather than intensive. There has, however, been a noticeable improvement of the dairy cattle kept in the Georgetown area;

prices for well-reared grade stock have increased while the demand for clean milk is greater and milk vendors are obtaining higher prices.

53. Year after year the intensive system of management practised on the Government Stock Farm has been advocated but without much success; breeding all the year round is still practised on the overcrowded savannahs in spite of the number of calves which are lost during heavy rains. It is impossible to ignore the fact that the majority of cattle owners and land owners know what can be done, but none are willing to incur any expense. Legislation with enforcement of regulations appears to be the only method by which pasturage and livestock can be improved on a large scale.

54. There has been a gradual improvement in the quality of pigs through the distribution to farmers of pedigreed breeding stock. The prices offered to producers, however, are still too low to make it remunerative for them to grow and feed their animals so as to produce a better quality carcass.

55. Comparatively little interest is taken in organised poultry production, doubtless due to the fact that the ruling prices for eggs and table birds offer no inducement for the rearing of poultry as a commercial proposition. An assured export market would be helpful.

56. Early in the year the Government Veterinary Surgeon visited Trinidad to inspect the class of slaughter animals supplied to that Island from Venezuela and to make enquiries as to the possibility of that island accepting slaughter cattle and pigs from British Guiana. From the information obtained he concluded that there was a market for the best type of coast cattle and also pigs, provided that they were inspected before shipment and some discretion practised as regards their selection for condition. Certain Berbice cattle dealers agreed to export under these conditions and during the year small consignments of cattle, pigs, poultry and eggs have been despatched every fortnight. This outlet with an increasing demand as indicated by the figures given in Table XV should encourage cattle-breeders of the coast to produce more and better cattle. In this connection legislative steps have been taken providing for the importation, duty free, of stock feeds of high protein content.

57. *Animal Health.*—Two outbreaks of Anthrax—not of a serious nature—occurred on sugar estates. No other infectious disease has been reported.

58. *C.D.F. Grant.*—During the year a free grant of £3,000 (\$14,400) was made from the Colonial Development Fund to provide for the improvement of the breed of cattle in the Colony. Twelve Herefords and Red Polls were imported from the United Kingdom towards the end of the year for this purpose. The extension of the existing livestock unit at the Georgetown Station has been proceeded with involving the erection of bridges, gates, fencing, etc. Similar work is in progress both in Essequibo and Berbice.

59. *Census Returns and Exports.*—The returns for livestock in the three counties for the year 1937, are given in Table XIII while Table XIV gives the livestock returns for the years 1933-1937. The exports of the horned cattle and swine from 1933-1937 with values are given in the Table XV.

TABLE XIII.
LIVESTOCK RETURNS, 1937.

County.	Horned Cattle.	Horses.	Mules.	Asses.	Buffaloes.	Sheep.	Goats.	Swine.
Berbice ...	47,750	714	556	4,630	58	22,906	8,146	14,015
Demerara ...	32,491	473	1,052	2,011	26	8,176	3,049	9,470
Essequibo ...	7,123	27	22	746	2	1,669	1,202	1,915
Hinterland Savannahs ...	42,176	1,811	12	4	...	622	109	1,267
Total ...	129,540	3,025	1,642	7,391	86	33,273	12,497	26,667

TABLE XIV.

LIVESTOCK RETURNS—1933-1937.

Year.		Horned Cattle.	Horses.	Mules.	Asses.	Buffaloes.	Sheep.	Goats.	Swine.
1933	...	159,935	5,616	1,594	7,582	170	35,004	22,408	18,769
1934	...	149,662	2,888	1,612	6,127	82	17,809	8,980	14,110
1935	...	128,211	2,874	1,545	6,165	61	27,584	12,191	22,600
1936	...	131,167	2,817	1,225	5,962	95	26,310	11,341	22,480
1937	...	129,540	3,025	1,642	7,391	86	33,273	2,497	26,667

TABLE XV.

EXPORTS OF CATTLE AND SWINE—1933-1937.

		1933.		1934.		1935.		1936.		1937.	
		No.	Value.	No.	Value.	No.	Value.	No.	Value.	No.	Value.
			\$		\$		\$		\$		\$
Cattle, Horned	...	458	7,173	920	11,909	349	4,770	95	1,229	578	5,830
Swine	...	413	1,593	973	3,561	544	1,768	321	1,222	579	2,316

SECTION II.

WORK OF THE DEPARTMENT OF AGRICULTURE.

Establishment.

60. The senior personnel of the Department of Agriculture at the end of 1937, including the Director and the Deputy Director of Agriculture, comprised six officers in the Research Branch, one Livestock Officer, five District Superintendents, one Assistant Superintendent and one Field Manager in the Field Branch, and one Rice Grading Inspector—a total of 17 in all.

61. The junior staff comprised five Agricultural Instructors, two Agricultural Assistants, 10 Technical or Field Assistants (4 in the Research Branch, two in the Field Branch, two in the Meteorological Branch and two in the Rice Grading Branch,) together with miscellaneous unclassified appointments and a clerical staff of 10 (at Headquarters).

62. The following new appointments were made during the year :—

Mr. E. G. Benson, B.Sc., Dip. Agric., A.I.C.T.A., formerly Assistant Agricultural Superintendent was appointed Agricultural Superintendent as from June 18, 1937.

Mr. E. M. Morgan, formerly Senior Agricultural Instructor, was appointed Assistant Agricultural Superintendent, as from June 18, 1937.

Mr. H. Cole, appointed Agricultural Instructor on a higher grade as from June 18, 1937.

Mr. D. W. Duthie, M.A., B.Sc., Ph.D., F.I.C., Lecturer in Chemistry at the Imperial College of Tropical Agriculture, Trinidad, was appointed Chemist as from August 7, 1937.

Mr. P. A. Chan-Choong, B.Sc., A.I.C.T.A., was appointed Assistant Plant Breeder as from July 22, 1937.

Transfer.—Mr. H. Macluskie, Agricultural Superintendent, was transferred to Sierra Leone as Agricultural Officer. He left on January 31 on three months' leave prior to assumption of duty in that Colony.

Resignation.—Mr. R. R. Follett-Smith, Chemist, resigned his appointment to become Consulting Chemist to a group of sugar firms as from June 13, 1937.

63. The officers who were on leave during the year and those who held various acting posts are shown below :—

The Hon. J. Sydney Dash, B.Sc., returned from furlough on May 7, 1937, and resumed duty as Director of Agriculture. During his absence, Capt. F. Burnett, M.C., M.A., Deputy Director acted as Director.

Mr. J. D. Gillespie, returned from furlough on May 17, 1937, and resumed duty as Agricultural Superintendent.

Mr. C. L. C. Bourne, Assistant Chemist, was granted seven months' leave of absence as from March 18, 1937. He was, however, recalled to act as Chemist and returned on June 4, 1937.

Capt. J. F. Irving, M.C., Senior Clerk, proceeded on leave as from June 9 to November 3, and resumed duty on his return on November 25, 1937.

Miss M. Cheong, Probationer, proceeded on leave on May 25 and resumed duty on her return on November 1, 1937.

Mr. E. B. Martyn, Botanist and Plant Pathologist, proceeded on leave on June 4 and resumed duty on his return on November 15. While on leave he represented the Colony at the Fourth International Grassland Conference held in the United Kingdom.

Mr. C. H. B. Williams, Sugar Agronomist and Plant Breeder, proceeded on short leave on June 12 and resumed duty on his return on July 1, 1938.

Major T. Bone, Government Veterinary Surgeon, visited Trinidad from February 11-24, with a view to inspecting Venezuelan cattle imported into Trinidad.

Capt. F. Burnett, Deputy Director, while acting Director, represented this Colony at the West Indian Fruit and Vegetable Council held in Trinidad from February 24 to March 2. Capt. Burnett returned on March 6, 1937.

64. The administrative work of the Department has been particularly heavy in recent months largely as a result of the difficulties created by the continued depression in price of all agricultural commodities, the sugar restriction agreement, and the necessity for close examination of any measure or proposal, however small, calculated to be of benefit to agriculturists. Meetings of various committees and boards, interviews and conferences have absorbed a great deal of time of the Director together with Executive and Legislative Councils' work.

65. I would like to express my grateful appreciation of the loyal help rendered by the staff during the year. The thanks of the Department are due also to the agricultural and mercantile community for assistance generously rendered, and to the local newspapers for their courtesy in distributing agricultural information.

A.—THE FIELD BRANCH.

66. The Field Branch of the Department of Agriculture is responsible for all extension activities. The work of this branch is under the immediate supervision of the Deputy Director of Agriculture. Details of the organisation of the field branch are as follows :—

Berbice ...	...One Agricultural Superintendent, one Assistant Superintendent and one Technical Assistant.
Demerara—	
East Demerara	...One Agricultural Superintendent, two Agricultural Instructors and one Agricultural Assistant.
East Bank and Nurseries, Georgetown.	One Agricultural Superintendent, one Agricultural Instructor and one Field Assistant.
West Demerara	...One Agricultural Superintendent and one Field Assistant.

Essequibo Coast and Islands..One Agricultural Superintendent, one Agricultural Instructor, one Agricultural Assistant, one Assistant for Land Settlement and one Assistant for rice grading.

North West District ...One Agricultural Instructor.

I.—INVESTIGATION AND EXTENSION.

Pure line padi seed distribution.

67. The extension of pure line seed padi in the rice growing centres throughout the Colony continued to form one of the most important duties of the divisional agricultural staff and a vigorous campaign of education and propaganda is maintained in all districts. In addition to the establishment of experimental demonstration blocks and private seed farms, instruction is also given in roguing and mass selection in the field. During the year 306,880 lb. of seed were distributed.

68. A recent investigation of the status of padi cultivation in the Colony in regard to purity gives the following approximate figures :—

Pure line	...	16.3	per cent. of the total acreage.				
Purity of 90%	...	29.8	"	"	"	"	"
Purity of between 90-75%	...	27.5	"	"	"	"	"
Purity between 75-50%...	...	17.3	"	"	"	"	"
Purity below 50%	...	9.1	"	"	"	"	"

This means that 73.6 per cent. of the total acreage under rice is of a purity greater than 75 per cent.

69. The position on the Essequibo Coast is not as satisfactory as might be expected due to the fact that certain proprietors insisted on an immediate change of variety following demands from their Trinidad customers for long grain rices, and they attempted to meet this temporary situation by a quick change to varieties not properly tested for yields and other characters. In one case even bulk seed of a mixed nature was obtained from India. Such methods, as anticipated, have not given the required results and, in most cases, proprietors are going back to the methods advocated by the Department. In this connection, it is pleasing to note the excellent progress being made on the Essequibo Islands—formerly a source of very inferior padi—where cultivators are showing great enthusiasm in carrying out the advice and recommendations of the Department.

70. Increased attention is being given to long grain varieties of which the best known local one at present is Demerara Creole, which does not appear well suited to the Essequibo Coast. Generally speaking, the long grain rices do not yield as heavily in this Colony as the medium length rices, which at the same time produce a very excellent sample of milled rice. Further reference to the variety question is made in paragraphs 169-180.

71. The following table gives particulars of seed padi distributed during the year under review :—

District.	Pure line seed (Departmental stocks)	Selected Seed (purchased)
	Bags (of 140 lb.)	Bags (of 140 lb.)
Berbice	797	...
East Demerara	559	170
West Demerara	190½	...
Essequibo	281½	...
Wakenaam and Leguan	194	... 170
	2,022	

Citrus.

72. Distribution of budded plants was continued. Orange plants are in greater demand as the local market for this fruit is better than for grapefruit. Trees of the

latter, on the better areas at Hosororo, produced a good crop of fruit, but there is still a tendency towards large size and coarseness. Budwood was supplied from the Hosororo orchard for the Botanic Gardens work and for private nurseries.

73. Table XVI indicates the distribution of citrus plants during the period 1936-1937; the total distribution from 1928-1937 amounted to 34,029 plants. This does not take into account plants raised in private nurseries. As already noted the after care of plants when set out leaves much to be desired.

TABLE XVI.
DISTRIBUTION OF CITRUS—1936-1937.

	Demerara.		Berbice.		Essequibo.		North West District.		Total Distribution.		Total Distribution, 1930-1937.
	1936.	1937.	1936.	1937.	1936.	1937.	1936.	1937.	1936.	1937.	
Budded Oranges ...	367	452	141	101	177	26	...	...	685	579	6,771*
" Grapefruit ...	231	49	68	18	156	2	...	...	455	69	5,646*
" Limes ...	6	10	...	1	...	...	...	...	6	11	4,521
Seedling Limes ...	66	24	7	4	3	...	...	...	76	28	16,589
Total ...	670	535	216	124	336	28	...	...	1,222	687	33,527

* During 1928 and 1929 a total of 502 budded oranges and grapefruit were distributed but not listed separately, making a total of 12,919 plants.

Cassava and Maize.

74. Numerous enquiries have been dealt with in connection with cassava and its by-products, while figures relating to acreage and average yields have been secured and supplied to those interested locally in the development of this industry. Generally speaking, yields are low and production costs high in comparison with those of Eastern countries and also with a Colony like British Honduras where certain developments have been taking place recently. Not long ago an offer was received from a firm in Canada quoting \$15.00 per ton f.o.b. Georgetown for sliced and dried cassava roots; local suppliers quoted \$60 per ton for such material. The recently formed Colonial Empire Marketing Board has been asked to supply statistics relating to probable demand and regular quotations for cassava products.

75. Local varieties are being studied in respect to their individual yield values while a collection of these and recent introductions from abroad have been brought together at the Georgetown Experiment Station for purposes of classification. Following on this a half dozen of the best varieties have been selected and replicated trials are being carried out.

76. *Maize.*—This crop is grown to a limited extent in the Colony, mainly on the river pegasse lands where it has proved a useful money crop after bush clearing, prior to establishment of Liberian coffee. Maize does not enter very much into the local dietary, rice being preferred, and the latter is more profitable for general cultivation. There is some demand, however, principally for stock feed and estates use a certain amount in rations for their mules. Local supplies are not always available and a certain quantity is imported which is not only cheaper but more dependable in quality than that grown locally. For these reasons, efforts to secure an extension of cultivation have not been very successful. Nevertheless, improved varieties have been introduced and distributed.

77. Some interesting results have been obtained with table maize or sweet corn. Varieties have been introduced into various tropical countries where after several generations of seed selection and elimination a high degree of purity has been obtained. In various trials by the Department the most successful has been an introduction from Puerto Rico and seed has been distributed. It should be borne in mind that seed of sweet corn when ripe presents a wrinkled appearance and in selection of seed from hybrid types it is important that only wrinkled cobs be used for propagation.

Banana Experimental Plots.

78. The Department undertook to lay down two five-acre experimental areas, further to investigate the economic possibilities of the Gros Michel banana and to secure data as regards likely production. One five-acre plot was located at Supply, East Bank, the other at Middlesex, No. 2 Canal, West Bank. The plots were planted in April, and after a good deal of supplying at the start were established. In September, however, at the end of the heavy rains, both plots were badly attacked by *Cercospora* leaf spot, which set the plants back considerably and weakened them. In addition, at the end of December, some 10–15 per cent. of the plants were attacked by Panama Disease. Spraying experiments have since been carried out to investigate the possibility of controlling the leaf spot disease in this manner, but it is doubtful if spraying will prove economically practicable for the farmer. At the time of writing this report 30 per cent. of the clumps at Middlesex have gone down with Panama Disease.

Land Settlement.

79. The small agriculturist in this Colony is best off, in the economic sense, where he is located near some source of part-time employment, such as a sugar estate, with the balance of his time occupied in food crop production, rice or cane-farming. Land settlement on a homestead basis is not easy of establishment due to the fact that conditions on the coastlands compel agriculturists to live in congested villages away from their holdings. There are one or two areas at present, however, such as the Canals Polder and East Bank, Demerara River, where it might be possible, given adequate drainage conditions, to develop small homesteads.

80. In order to secure more reliable data in regard to possibilities in this direction, the Department of Agriculture drew up a scheme in 1936 for a limited number of experimental farm settlements to be worked under the supervision of the District Agricultural Officers. The primary object of these settlements was to provide information on which recommendations could be made regarding questions such as the optimum acreage for an economic farm for a small farmer under local conditions, the labour units required to operate such a farm and the returns to be expected. Further, it was intended that such settlements should be useful not only for the information gained but also to assist materially in demonstration work.

81. *Pln. Toevlugt*.—Thus far, mainly for financial reasons, it has been possible to establish only one such farm unit—at Plantation Toevlugt, West Bank, Demerara, where there is a fairly satisfactory drainage system. The site is typical of the better drained river areas and was secured mainly through the generous co-operation of the Hon. A. G. King. The land like much of the surrounding agricultural area has been under second growth vegetation for approximately twenty years. A central site of five acres was originally selected, and operations were begun in February, 1937, to lay out the area. Later it was considered advisable to increase it to ten acres so as to include adequate provision for stock, forage, etc. as well as a wood lot, the intention being to make the farm entirely self-supporting. The establishment of the farm unit is based on a definite working plan drawn up with the object of devising the best system of planting crops under proper cultural methods. It includes maintenance and improvement of fertility by crop rotations, fallows and the keeping of stock, as well as intensive cultivation of vegetable garden produce.

82. The farm unit is divided by a main drainage trench into two sections—Block “A” and Block “B”—and is under a well laid out scheme of internal drainage with an outlet koker which provides for efficient drainage throughout the heavy rainy seasons. Block “A” consists of four acres for the erection of the homestead dwelling, pasture land, the cultivation of fodder grasses and the rearing of pigs, poultry and other livestock. Block “B” covers six acres and is designed for the cultivation of permanent, semi-permanent, cash and food crops.

83. Work began in February, 1937, on Block "B". Four acres were cleared and burnt and prepared for cultivation. This section is divided into twelve plots. In May, seven plots were planted respectively with sweet potatoes, plantains, bananas, tannias, cassava, eddoes, yams and maize. In August, the remaining two acres of this section were cleared and, in November, sown with maize. In December, the planting of budded citrus plants of Marsh grapefruit and oranges was begun. A selection of seed coconuts was sown in a well-prepared nursery in the remaining plot of this section. Minor crops of pumpkins and black eye peas were also grown during 1937. The maize crop sown in May, 1937, was reaped in August and the sweet potato crop planted in June was harvested in November of the same year. The sale of the produce of these crops was placed to the credit of the enterprise. In December the vegetable plot was being brought under cultivation with cabbage, tomato, carrots, beet, onions and lettuce. The farm unit is worked by the employment of farmer-labour and careful records are kept of the number of man-hours required for the cultivation of each crop and the revenue therefrom. It already serves as a demonstration and seed distributing centre and is attracting considerable attention in the district.

84. *Anna Regina Estates*.—The Anna Regina Estates were leased for a further period of one year to Parikhan Rai. Such leases are very unsatisfactory as it is difficult to force the lessee to carry out his obligations in respect to maintenance. On the other hand, it is the only possible method, awaiting a decision in respect to future policy regarding these estates.

85. *Bush Lot Land Settlement*.—The health of the Bush Lot Settlers may be considered as normal for the year under review. In accordance with the usual custom the settlers' padi was put up for tender and the sale effected through the Agricultural Superintendent, deductions for settlers' debts to Government being made at the time of sale. A total of \$1,823.88 was collected and credited to settlers accounts. The settlers have also been encouraged to plant vegetable gardens behind their houses, and at present there is a total of 15 such gardens on the settlement. An area of about 40 acres, behind the rice fields at Bush Lot, was fenced off and used as a pasture, while a fence has been erected between the settlement and the eastern rice fields to prevent the cattle straying there.

86. A statement of the revenue collected from the Anna Regina Estates and Bush Lot Land Settlement is given hereunder :—

Lease of the Anna Regina Estates	...	\$ 2,000 00
Bush Lot Rents	... \$ 762.91	
" " "	... 419.78	1,182 69
Sale of scrap	... ..	545 17
Refund of advances	... ..	1,096 04
Interest on advances	... ..	48 29
		\$ 4,872 19

Field Competitions.

87. The following agricultural competitions were held during the year :—

Pure line seed padi.—For the best pure line padi seed farm and for the subsequent care taken of the seed harvested. The area established and the seed reserved to be sufficient to supply the growers' seed requirements for the following season's planting.

Coffee.—For the best exhibit of Liberian coffee of commercial standard.

Sweet Potatoes.—For the best 140 lb. bag of graded sweet potatoes.

88. The padi competitions were held in the following districts :—Berbice—Lower and Upper Corentyne and West Coast ; Demerara—East Bank, and East

and West Coasts; Essequibo—Coast and Wakenaam and Leguan Islands. The coffee competitions were held in the Canals Polder and in the North West District, while the sweet potato competition was confined to the Pomeroon District. Money prizes were awarded to the various prize winners.

Beekeeping.

89. The year was one of great activity in the Beekeeping Division which has now been established for five years. Interest in beekeeping continued to spread, the industry being better organised and young beekeepers more numerous. The demand for advice and demonstration bore testimony to the need that was created and is now felt for beekeeping extension work. The demand for Italian queens continued to make it necessary for the Department's demonstration and queen-breeding apiary to concentrate almost entirely upon the production of queens. Despite the restrictions enforced by financial considerations, the number of mating and nucleus hives had to be increased from fifteen to over one hundred. Two pure-bred, purely mated, tested Italian queens were imported from the United States. One shipped in a relatively small cage, arrived in poor condition; the other, received in a much larger cage, is producing progeny which, according to reports from the districts, are probably the best egg-layers that have yet been distributed by the Department. During the year 196 queens were distributed compared with 153 in 1936, 102 in 1935 and 92 in 1934. The number of nucleus hives with queens distributed during the year was 22.

90. Observation on the weights of three scaled hives is maintained, weights being taken daily and increases or decreases recorded. One of the plans envisaged is to collect similar hive weight information from the rural areas where honey flow conditions may be different from those near Georgetown. The Apiary has under consideration plans for collecting information dealing with some of the other factors which are considered likely to affect honey yields, *e.g.*, the systematic uniting of hives, excluders versus no excluders, etc.

91. Extension work in close collaboration with the British Guiana Beekeepers' Association continued to give encouraging results. The trend of membership—which may be regarded in some measure as a yardstick by which the usefulness of such an organisation can be judged—has moved steadily upwards from year to year. One of the year's chief activities included a honey-advertising campaign, the two most attractive items on the programme being an illustrated "Honey Babies' Feature" run in one daily newspaper and a "Honey Jingles Competition" run in another. The result was a marked increase in honey consumption.

92. A lantern lecture on bees was given by the officer in charge of beekeeping activities to the "New Age Society" in Georgetown.

Plant Distribution in the Hinterland.

93. Consistent trials have been made with the distribution of planting material of economic crops for trial in the Hinterland, while seed of various vegetables have been despatched for distribution in the mining areas. Among the more important have been the following:—

Forage Crops: Demerara Primrose, Wynne Grass, Uba Cane, Guatemala Grass, Elephant Grass;

Edible Peas and Beans: Pigeon Pea, Bush Bonavist, Lima Bean, Waby Bean, Yard Bean, Madeira Bean, Bountiful Bush Bean, French Beans;

Truck Crops: Tomatoes, cabbage, ochroes, squash, lettuce, pumpkin, carrots, onions, egg plants, radish, cucumber, beet, celery, turnips, parsnips;

Tobacco: Sumatra A, Warne, Azores Superior Type, Maryland Broad Leaf, Improved Gold Leaf, Big Havana, Comstock Spanish, Kentucky One Sucker, Ward's Burley, Vaughn's White Burley, Hickory Pryor, Yellow Mammoth;

Sweet Potatoes: Black Sam, Black Rock, Six Weeks, Milton, Strongman.

Botanic Gardens and Nurseries

94. The administration of the Botanic Gardens constitutes an important phase of the Department's activities. In addition to their function as a Public Garden and one of the major tourist attractions of the city, the Gardens render considerable assistance to local residents by the propagation of plants and the rendering of advice and assistance on horticultural matters.

95. *Economic Section.*—The rearing of seedlings of various economic plants, which are basketed for disposal to farmers and others, was maintained throughout the year, and the various trials of vegetables, in order to select those best suited to local conditions, were continued. In addition, the usual propagation of mangoes, citrus, and avocado pears of recommended varieties was carried on, to fulfill numerous orders booked.

96. *Ornamental Section.*—During the year, repairs were carried out by the Public Works Department to the Front Office and one of the side line bridges, and a further extension made to the pipe line north of the avenue to improve irrigation and watering facilities during dry weather. New rose beds were made near the nursery and a number of new rose varieties introduced, also a fine collection of Dahlias from Holland was obtained, and attracted a good deal of attention when in bloom. The rockery as usual proved a source of attraction to tourists, and was kept well filled with a varied display of plants. The plant houses were maintained during the year, and there was a particularly fine show of orchids in bloom during August.

97. *Seed and Plant Exchange.*—The exchange of seeds and plants with allied institutions and private individuals resulted in a further number of new additions to the Gardens and, during the year, a large number of new introductions, obtained in this manner, were planted out in the Front Gardens and on the avenue. A large selection of seed of ornamentals was received from the Arnold Arboretum of Harvard University during the year. Collections of Amaryllids were also received, in exchange, from Florida and from Natal. The Department was again indebted to Trinidad for ornamentals and economics, both plants and seeds being exchanged. The U.S. Department of Agriculture's station in Puerto Rico sent some welcome additions to our collection of fish poison plants, including cuttings of *Derris elliptica*, and also some ornamental plants. Seed of *Cyphomandra betacea*, the tree tomato, was obtained both from Jamaica and from the Amani Institute. Among the most successful of the newly introduced ornamentals was a purple species of *Salvia* from Bermuda, whence were received a number of other new plants, and *Strobilanthus isophyllus* from the Arnold Arboretum. Palm seed was again exchanged with the Coconut Grove Palmetum, and several new and interesting species were obtained for the Gardens.

Plant and Seed Distribution.

98. The following is a list of the planting material distributed locally by the Department during 1937, and the total distributions from 1928-1937.

	Field and Garden Crops.	
	Distribution 1937.	Total Distribution 1928-1937.
Sugar Cane	... 333,222 cuttings	2,709,800 cuttings.
Padi (seed)	... 306,880 lb.	1,700,989 lb.*
„(seedlings)	... ..	260,000
Plantains	... ..	4,143 suckers
Bananas	... 1,258 suckers	11,598
Papaw (seed)	... 6 oz.	9 „lb. 6 oz.
„ (seedlings)	... ..	3,855
Grape Vine	... 14	234
Tobacco (seed)	... 4 lb.	28 $\frac{3}{4}$ lb.
„ (plants)	... ..	1,652

*Exclusive of 801,780 lb. distributed from 1934-36 for flood and drought relief measures.

Field and Garden Crops.

	Distribution 1937.	Total Distribution 1928-1937.
Legumes (Cove's Crops)	... 5 lb.	2,047 lb.
Peas and Beans (Edible)	... 264 "	2,855 lb.
Soya Beans	... 2 lb.	497 $\frac{3}{4}$ lb.
Fodders (Various)	... 250,300 cuttings.	320,576 cuttings.
" "	... ..	600 tops.
" "	... 500 plants.	1,500 plants.
Onion (seed)	... 24 lb.	459 lb.
" (seedlings)	... ..	123,775
" (bulbs)	... 18 $\frac{1}{2}$ lb.	18 $\frac{1}{2}$ lb.
Tomato (seed)	... 12 oz.	21 lb. 4 oz.
" (seedlings)	... 1,068	21,114
" (cuttings)	... ..	92
" (fruit)	... ..	1,164
Ground Nuts	... 125 lb.	531 lb.
Sorghums	... ..	50 lb.
Eschallot	... 46 $\frac{1}{2}$ lb.	83 $\frac{3}{4}$ lb.
Cabbage (seed)	... ..	7 $\frac{3}{4}$ "
" (seedlings)	... ..	922 "
Cauliflower (seed)	... 2 ozs.	2 ozs.
" (plants)	... 6	6
" (fruit)	... 6	6
Jerusalem Artichoke	... ..	238 lb.
Indian Kale	... ..	230 suckers.
Boulangier (seed)	... 2 oz.	2 lb. 5 oz.
" (seedlings)	... 1,098	1,542
Ginger	... ..	23 $\frac{1}{4}$ lb.
Sweet Corn	... 4	6 $\frac{3}{4}$ lb.
Broom Corn	... ..	74 lb.
Jute	... ..	3 lb.
Vegetable Seed (Assorted)	... 8 $\frac{3}{4}$ lb.	65 $\frac{1}{2}$ lb.
Chili (seed)	... ..	96 lb.
" (seedlings)	... ..	2,396
Sweet Potato (cuttings)	... 5,875	280,570
" " (tubers)	... 48 lb.	366 lb.
" " (No.)	... ..	11,110
Cassava	... ..	21,170 cuttings.
Ground Provisions (Eddoes, Tannias, Dasheens and Yams)	... ..	1,210 lb.
Pineapple	... ..	472 suckers.
Krowa	... ..	37 "
Orchard Crops.		
Citrus (budded) Oranges	... 579 plants.	6,771 plants.
" " Grapefruit	... 69 "	5,646 "
Limes (budded)	... 11 "	4,521 "
" (seedling)	... 28 "	16,589 "
Coffee (Arabian)	... ..	1,438 seedlings.
" (Liberian)	... ..	12,371 "
Cacao	... 2,486 seedlings	10,867 seedlings.
" (pods)	... 10	268
Mangoes (Grafted)	... 131 plants	847 plants.
Pears (Grafted)	... 29 "	345 "
Nutmeg (seedlings)	... 3	375
Other Economics	... 976 plants	9,714 plants.
Seed Coconuts	... 60 "	90

II.—MISCELLANEOUS MINOR CROP TRIALS.

99. The present seems an opportune time to review the efforts of the Department with new varieties of crop plants and miscellaneous introductions since 1927 in an endeavour to widen the scope of agricultural production in the Colony. The Agricultural Journal and the Divisional Reports have contained frequent references to this work.

Peas and Beans.

100. An early start was made with the cultivation of different types of peas and beans and importation of varieties which it was anticipated might give good results locally. The object in encouraging cultivation of these crops was partly to secure the benefits to be derived from the use of a legume crop but, more particularly, to increase the local food supply for man and livestock. Thus, in the case of pigeon peas, by 1930 the collection was increased with fourteen imported from Trinidad, nine from Puerto Rico and one from India. These varieties were grown on the several experiment stations and seed of the best types distributed to farmers. In the case of black eye peas, the use of this crop was encouraged both to provide an effective and quick soil cover and because these peas are among the most popular consumed locally. In 1934 an appreciable quantity of selected seed was imported from the United States Department of Agriculture and the tendency for wholesale purchasers to look to the local suppliers has steadily increased. This crop is now one of the most important in the Pomeroon District.

101. Trials have been systematically maintained with other edible types such as Dwarf Bonavist (*Dolichos lablab.*), Waby bean (*Dolichos lablab* var. *macrocarpa*), Mung and Urd (*Phaseolus Mungo* and *P. Mungo* var. *radiatus*), Sinebone (*Phaseolus vulgaris* var.) and Lima Beans (*P. lunatus*). Resulting from the distribution of seed there is now much more widespread cultivation of these crops than formerly.

102. As an aid in the extension services of the Department, a leaflet on peas and beans was issued in 1932. This was widely distributed to farmers in the various districts and gave a simply worded account of the different types which were found to be the most suitable to local conditions and of the cultural practices to be adopted. Subsequently, in 1937, another article giving the results obtained to date was published.

103. Certain types of dried pulses, e.g., split peas (*dholl*) and beans, figure among commodities imported and are deserving of more attention by farmers, especially where family labour is available for threshing, etc. Attempts to obtain suitable and non-expensive machinery for splitting local peas have not been so far successful but efforts are continuing.

Soya Beans.

104. With the establishment of sub-stations in different districts, few crops were given a more thorough and extended trial than Soya Beans. Seeds of different varieties was imported and grown in trials year after year. It was found, however, that the yields were seldom satisfactory and with those varieties which gave even fair yields the seed lost its viability so soon after reaping that considerable difficulty was experienced in establishing succeeding crops. Nevertheless, it should be pointed out that when repeated crops were grown in the same area, and the necessary symbiotic bacteria apparently established, increased yields seemed to result; it was also found that better results were obtained if seed which was reserved for planting was left unshelled during storage. Of the different varieties imported, Caracas White brought by the Director from Trinidad where he had been working on the crop, and O.A.C. 211 from Canada were the most promising.

105. After years of trial with the crop, the conclusion has been reached that soya bean cultivation is unlikely to prove generally profitable under our climatic and ecological conditions.

Groundnuts.

106. Arising out of the recommendations of the Wilson and Snell Commission report, the then Governor, Sir Cecil Rodwell, in 1927 leased from the Enmore Estates Limited about $1\frac{3}{4}$ acres of sandy soil for experimental purposes. This area, called Plantation Cecilia and later converted into a sub-station of the Department, is situated on the frontland of Enmore Estate. Here, a trial with groundnuts was laid down at the Governor's personal expense with three main objects:—(1) to test different varieties; (2) to compare the results of different planting distances; (3) to judge the most suitable size and shape of planting beds into which to sub-divide plots by means of intersecting drains. Results showed that the cost of planting, cultivating and reaping even without the preliminary expenditure unavoidable in the first year, would still amount to a sum which would leave little margin for profit.

107. At the end of the first year the Governor wrote:—"My general conclusion is that the cultivation of groundnuts in British Guiana while undoubtedly a profitable undertaking on a small scale for the peasant proprietor or even on a large scale for an estate proprietor who is assured of a supply of labour, does not offer sufficient inducement to the investor who has to clear land for the purpose and take his chance of obtaining labour at the planting and reaping seasons when a special force is required."

108. One clear indication was that the best variety of those tried was Virginia Bunch, seed of which was distributed to small farmers.

109. In 1928 an agricultural inspection of small farmers' groundnut cultivations showed these to be disappointing. Various other varieties were introduced, *e.g.* Venezuelan nut, in 1929. In 1930 an experiment was tried with five varieties; both shelled and unshelled nuts were sown. There seemed to be little difference in yield but in the presence of ants losses from shelled nuts were greater. Later experiments were extended to Henrietta, Essequibo, and various varieties were propagated. Distribution of seed was continued but farmers displayed little tendency to include this crop in their regular enterprises. A great deal of hand labour is required which the average farmer finds more profitable to apply to the staple crops of his cultivation. There is a small demand for seed every year and the variety Virginia Bunch is favoured.

Sweet Potatoes and Yams.

110. An early start with sweet potato trials was made at Sub-station Cecilia and plots established. From this nucleus planting material was distributed to other stations and to farmers. In Berbice manurial trials were carried out in collaboration with the Prison Department. The varieties tried were:—

Local—Strongman; Garden; Milton; Pink Stem; Essequibo; White Stem; Garden Variety; Strongman White; Turkey Foot; Chinese Slip; Walkmen; Transparent.

Imported—Black Sam; Red Nut; Black Rock; Carolina Lea; Six Weeks; St. Vincent; Brook's Gem; Philippine; White Gilkes.

111. The variety which has been found to give consistently good results is Black Rock—a Barbados variety—and plots of this are grown for the purpose of supplying farmers with planting material. In addition to tubers about 60,000 cuttings are distributed annually from Sub-station Cecilia alone. Farmers have been instructed in regard to the importance of grading for type, size and quality.

112. *Yams*.—Yams can be grown quite well on the lighter soils with a little care and attention, and a number of locally cultivated varieties are found suited to the local markets. Attempts to introduce new varieties have not proved very successful. Seven varieties obtained from Trinidad in 1934 were given a trial in the North West District; of these the Chinese or Potato Yam, which had also been

grown successfully at Sub-station Cecilia, proved satisfactory, while two varieties of Lisbon Yam—Bottle Neck and Ordinary, grew well, and produced excellent yields of good quality roots. The Lisbon varieties compare favourably with the Barbados yam but were criticised by farmers on account of their large size.

Green Manures and Cover Crops.

113. In order to secure information on plants which would be suitable for weed control and green manuring, many locally grown legumes were collected and grown under observation; in addition many types which might prove suitable under British Guiana conditions were imported. The chief of these were:—*Crotalaria sericea*, *C. usaramoensis*, *C. Juncia*, *C. striata*, *C. quinquifolia*, *C. retusa*, *C. sp.*, *Centrosema pubescens*, *Calapagonium muconoides*, *Canavalia ensiformis*, *C. gladiata*, *Indigofera hirsuta*, *I. endecaphylla*, *I. sp.*, *Dolichos hosei*, *D. lab. lab. var. (Bush Bonarist)*, *Tephrosia Hookeriana*, *Pueraria javanica*, *Phaseolus semi-erectus*, Woolly Pyrol, (*P. mungo*), Black creeping Gram (*P. mungo var. radiatus*), *Stizolobium aterrimum*, *S. Deeringianum*, *S. niveum*, *Sesbania sericea*.

114. The results indicate that the most promising cover for orchard or coconut cultivation is *Indigofera endecaphylla*. It was at first found to be a shy seeder but later seeded much more fully; the seed, however, is expensive to collect on account of its small size. For practical purposes propagation by cuttings is recommended. It should be remembered that *Indigofera* is also useful for fodder purposes, it being found possible to cut in six weeks during rainy weather.

115. For weed control and easy establishment, Bengal Bean, *Stizolobium aterrimum* has been found particularly suitable due to the fact that it will last for 11-13 months, but because of its vigorous climbing propensities it is of little use as a cover in an established cultivation.

116. It has been found that *Dolichos Hosei* has given promising results during long rainy periods under orchard conditions. In the open or during dry weather poor results are obtained. Some of the *Vigna* group (including black eye peas) have given good results as smother crops, but one of the chief disadvantages of this group is the short duration for which the crops grow (about three months). The black eye pea, however, is also a money crop.

117. *Canavalia* gives moderately good results as a cover and has in its favour the fact that it is easily turned under and is, therefore, suitable for use as a green manure.

118. The Department has from time to time distributed seed of most of these types in the farming districts but on the whole farmers have shown little interest in the use of either cover crops or green manures.

Forage Crops.

119. An early start was made with trials with local and imported varieties of fodder crops with a view to improving the forage supply. The crops grown under observation included the following:—Uba Cane, Elephant Grass, Guatemala Grass, Demerara Primrose, Guinea Grass, Para Grass, Wynne Grass, Horse Weed (*Alisycarpus vaginalis*), Teosinte (*Rena luxurians*) and *Indigofera endecaphylla*.

120. Of the imported crops, Guatemala Grass, Teosinte and *Indigofera* have given the most promising results; Demerara Primrose and Horse Weed have also found much favour.

Tobacco.

121. Plans were inaugurated in 1927 to establish systematic experiments with the cultivation of this crop. By 1928 small plot trials were being made with ten varieties. From an area of one-third acre, 483 pounds of tobacco were reaped. The tobacco was cured by plantation methods, the whole plant being cut and hung in the drying barn. The loss resulting from poor curing and mildew was appreciable.

In 1929 two trials were made in the early and latter parts of the year and on these areas mosaic is reported to have made its appearance. From the results of these trials it was apparent that Kentucky One Sucker, and Yellow Mammoth—two heavy types—were the varieties which were likely to give the best yields. The heavier types were preferred both because the demand for black tobacco was considered greater and because, without facilities for flue curing, trials with the cigarette types (for which there was then little demand) were unprofitable. By 1930 the demand for tobacco seed was reported to have increased appreciably, but the sustained dry weather at the end of the year reduced yields and discouraged cultivators.

122. Trials and distribution of seed were continued. The chief cause of loss to growers appeared to be the prevalence of mosaic. Many efforts were made to encourage cultivators to take steps necessary for control but the precautions demanded are such that few farmers will continuously observe them. Mole-cricket in the nursery stages and the hawk moth both in the field and in the curing shed were also found to demand great attention. A major problem is the difficulty of securing a cured product of sufficiently high standard in our humid atmosphere, even after leaves have been satisfactorily produced in the field.

123. As a result of the increased manufacture of cigarettes locally the demand has veered from the heavy to the bright leaf types and in order to stimulate local production plans were made at the end of 1937 for conducting a series of trials with flue-curing.

Oil Palms.

124. Trials with Oil Palms had been initiated by the Department in 1913 but did not prove successful. In 1932, however, further trials were begun. Seed was obtained from trees remaining from the earlier trials, and special strains were also introduced from West Africa and the Dutch East Indies. Small experimental areas were planted at Macaw, East Bank, Berbice River, at Hosororo, North West District, on the pegasse, and at Sub-station Wauna, North West District, on the grey sandy soil. A number of plants were also supplied to the Fruit and Canning Company and the Demerara Bauxite Company on the Demerara River.

125. On each of these sites the palms have received very little attention, and only occasional weedings, but have nevertheless grown quite well. Flowering began in 1936 in one or two instances, and a number of palms flowered and fruited in 1937. It is too early yet, however, to make any estimates of yields. At both Hosororo and Wauna the growth of the palms on very poor soil was promising, but on the pegasse one or two have already shown signs of wilting, and it is doubtful if this particular environment is suitable.

Fibres.

126. In 1928 attention was drawn to the plots which were being tried in Jute, and Urena or "Patwa" fibre as it is called locally. The opinion was soon formed that Jute was not suited to local conditions. One of the difficulties discovered with Urena is that it seeds sparsely in cultivation and is not easy to establish. These trials were later extended to include Crowa (*Ananas sativus* var.), Malva or 'Jumbie ochroe' (*Malachra capitata*), Manila hemp (*Musa textilis*), Ramie (*Boehmeria nivea*) and *Sansevieria zeylanica*. These plots were kept under observation and experiments were made with the actual preparation of the fibre. Such poor results were obtained in the field, however, that the experiments were discontinued and their cultivation regarded as uneconomic.

127. These conclusions tend to support those formed during a previous regime. For example, the late Sir John Harrison wrote in 1925 concerning Malva as follows:—

"The reasons why *Malachra* fibre has not been developed commercially are simple (a) the low yield of fibre from the stems (b) the great difficulty of separating the commercial fibre from the stem by retting and beating.

"The beating has to be done by hand, no machine having been invented for this purpose.

"I have recently had samples of Malachra fibre prepared at the Botanic Gardens from plants growing at Sophia Station. The yield of clean fibre was rather less than 3 per cent. of the weight of green stalks. The cost of gathering the stalks, retting them and separating the fibre by hand-labour, was somewhat over \$708 per ton of the fibre obtained.

"Personally, I fail to perceive that we are missing anything beneficial to the Colony by not undertaking the commercial exploitation of a fibre product, when the production of that product costs \$708 per ton in British Guiana and is saleable in London at £60."

128. Another fibre plant to engage the Department's attention is the Ginger Lily (*Hedychium coronarium*) scattered patches of which are found on the creeks and rivers of the North West District and elsewhere. Though earlier experiments had not proved promising, as a result of recent enquiries a large plot has been planted at Hosororo in an endeavour to ascertain the probable yields and economic possibilities of this crop.

Panama Hat Palm.

129. A few plants of the Panama Hat Palm (*Carludovica palmata*) had been in cultivation for some years at the Hosororo Station. Recently, the Carnegie Trade Institute asked to be supplied with a quantity of leaves for making hats and the number of plants was increased accordingly. This 'Palm' grows quite well on the laterite hills under light shade.

Citronella Oil.

130. Trial plantings of Ceylon Citronella grass were made in the North West District in 1932; the grass soon established itself and showed great promise. Samples taken about a year later, when it was obvious that the grass could be planted on a commercial scale, gave an oil content of 1.1 per cent. on the sun-dried material. Time was then allowed for the grass to grow for the full commercial span of five years, in order to ensure that any pests or diseases would show up before experimental work on distillation was started. Test cuttings gave yields of 40,000 lb. fresh material per acre, equivalent to 170 lb. oil, at one cutting. With three or four cuttings per annum, as is the practice in Ceylon, this figure would be much higher and thus cultivation of the grass on a commercial scale would be comparatively easy.

131. As regards extraction of the oil, a serviceable still was constructed for the Department by Mr. H. J. Samson of Mabaruma, North West District, and trial distillations were carried out with considerable success from the technical point of view. The grass used was too old to give the best quality oil, and analysis of one sample gave 32 per cent. geraniol compared with 55-65 per cent. from Ceylon oil. Since, however, it has been found that cultivation of the grass can be carried out over a number of years, and the distillation shows promise, further experimental work is in progress with freshly planted grass to be cut three or four times a year. The local market requirements and the possibility of export to the West Indian Islands are also being investigated, but prices are very low.

Fruit Crops.

132. *Mangoes*.—Mangoes are not ideally suited to this Colony, and though big trees of seedling mangoes may be seen growing plentifully on estate dams, the grafted varieties do not as a rule grow very vigorously, and their fruiting is uncertain, being largely dependent on the vagaries of the seasons. To supply plants for growing in private gardens, the Department has introduced a number of the best West Indian varieties. Trees of selected varieties already growing in the Colony have been used to form an orchard from which grafted plants may be obtained to supply orders.

133. The market for mangoes is a limited one and any extension of the export industry will have to be linked up with frequent shipping service and suitable cold storage accommodation. The Julie and Jamaica Bombay are the varieties favoured in the United Kingdom and Canada, and are recommended for propagation by the West Indian Fruit and Vegetable Councils.

134. Small trial shipments have been made from this Colony to Montreal, on which favourable reports were received. The fruit, however, needs careful packing; cold storage facilities prior to shipment are lacking and the supply is at present too uncertain to encourage the building up of an export trade. It is worthy of mention that the Julie mango has been found to travel and ripen better when picked at a rather more mature stage than was formerly the practice. If the fruit is picked when it is too near ripening it matures on the ship and if too green, the flesh is sour and unpalatable on arrival at market.

135. *Pineapples*.—In 1928, sections at the North West District Experiment Station and at Sub-Station Cecilia were devoted to trials with pineapple varieties collected and imported from various sources, and subsequently propagation was also continued on the sand reef of the Anna Regina Estates. By 1930 the following varieties were under observation :—

Black Antigua, Baby, Buck, Bush, Bull Head, Chocoma, Comina, English Sweet, Maipouri, Montserrat Red and White, Queen, Red Spanish, Smooth Cayenne, Sugar Loaf, Tiger Head, White Pine.

136. In 1930 the pineapples under cultivation in the North West District were badly affected by 'Black Rot,' the only resistant variety being Tiger Head, and in 1931, the plots at Cecilia suffered considerably during a long spell of dry weather, and some of the varieties were lost.

137. Meanwhile, late in 1930 the British Guiana Fruit and Canning Company was granted a concession at Dalgin, on the Upper West Bank of the Demerara River, for the purpose of cultivating and canning pineapples. The Department carried out a preliminary soil survey of the site, and as it was apparent from the outset that the application of artificials would be essential, laid down and superintended a number of trials to determine the best method of applying the fertilisers required.

138. The better known commercial varieties, Smooth Cayenne, Red Spanish and Queen were obtained by the Department from Hawaii, Puerto Rico and Malaya and supplied to the Company. As cultivation continued, the Company received assistance from the Department in many directions, attention being given to pests and diseases affecting the crop and detailed studies being made by the Chemical Division of various factors concerning the treatment of the fruit in the factory and the canning.

139. The Company suspended operations in 1935, having expended a considerable amount of capital on plant and buildings before the basic problems had been properly studied, or the cultivation area sufficiently extended.

140. *Avocado Pears*.—The Avocado Pear is popular as a salad fruit. The majority of the local sorts have a large seed in proportion to the size of the pear, with correspondingly thin pulp. Improved varieties have been introduced by the Department, and the two best of these are the Pollock and Rudder. Both are smooth, green pears of good size with a high proportion of richly flavoured flesh to seed. In addition, budded and grafted plants, the scions of which have been selected from especially good trees in local gardens, are raised at the Gardens and are well suited for planting by private individuals desirous of growing one or two good trees to supply their own tables.

141. *Papaws*.—A fruit which is in demand all the year round is the papaw.

Generally speaking, the local market favours a large fruit without due regard to quality. It is well known, however, that while a large fruit may be acceptable to a large family, a certain amount of wastage is inevitable and small families are precluded from enjoying this fruit to the extent that should be possible. Some attention has been given to the papaw; importations of a number of types have been made and their progeny studied in comparison with local varieties. For some time now the Department has been recommending a small type, large enough for one or two persons, seed of which was obtained originally from Panama. The fruit is about the size of a well developed Bartlett pear with thick firm flesh, very small seed cavity, and of a delicate nutmeg flavour. Those who have tried this papaw speak very highly of it; yet it is difficult to get the average farmer to plant this variety on account of the inherent prejudice against its size. Since quality and large size in fruit and vegetables are not closely associated it follows that the consumer must get into the habit of thinking in terms of quality rather than size. Some success has been achieved by crossing the Panama papaw with a few of the local large varieties.

142. *Guavas*.—Guavas have always been regarded as a crop which, on account of the prolific growth and fruiting under local conditions, is capable of more general exploitation than at present. The more extensive cultivation of this crop was at one time submitted for consideration on the waste lands of the sugar estates. Farmers have been encouraged and seedlings of selected varieties have from time to time been distributed, but interest has been fitful. In some years the seedlings raised have to be thrown away as they were not required. With the demand for guava products both for domestic and export sales, it is hoped that this crop, which is produced with the minimum of care, will continue to receive increased attention. It is claimed on the other hand that the prices paid, when the difficulty of collection and transport to Georgetown are considered, offer no great inducement to collect the fruit.

Spices and Peppers.

143. *Ginger*.—Varieties of ginger have been introduced by the Department both from Dominica and Jamaica. The crop makes very poor growth on the coastlands, but is cultivated fairly successfully in the North West District. There is a small demand for green ginger among the Chinese community in Georgetown and it is more than filled by the output from the North West District where even the few growers have to limit their output. The preparation of the dried product although simple is seldom attempted on any scale since there is competition from the cheaply grown West African article on the local market.

144. *Turmeric*.—A few roots were obtained from Ceylon and grown at the Botanic Gardens but did not show much promise. It would probably fair better in lighter soil, but the chief hindrance to its cultivation locally has been the difficulty in curing.

145. *Camphor and Cinnamon*.—Five attempts were made between 1930 and 1935 to introduce *Cinnamomum Camphora* and *C. Zeylanicum* from West Africa and Ceylon, both roots and seed being tried. In every case, however, the material sent failed to survive the journey.

146. *Chillies*.—In 1932 pure line seed of the best commercial types was ordered from Ceylon, India and Palestine; some of the chief varieties obtained were "Shatta" from Palestine, "Tanjore" and "Tinevelly" from Madras, "Long," "Round" and "Godavari Red and Yellow" from Southern India. Seeds from these were grown on the heavy soil at the Georgetown Station and the light soil at Sub-station Cecilia. When fruit was reaped, the seed thus obtained was distributed to farmers and repeated attempts were made to interest local growers in this crop. Quotations obtained for the dried product in Canada were only about nine cents per pound, and as considerable labour was involved in the cultivation, reaping and preparation for shipment, there was little profit to be made.

147. From the point of view of local consumption the imported types did not meet with favour. The general opinion was that the skin was too tough and parchment-like and that the local 'Bird' pepper was preferred. In regard to sun-drying for export, the difficulty experienced was that of retaining a uniform colour in the dried article. In 1936 a small shipment was made to Canada but the results were not encouraging.

148. *Black Pepper*.—Plants of *Piper nigrum*, including one of the variety Balamcotta, were obtained through Kew in 1931 and planted at Hosororo. After a poor start, the plants were found to make fair growth at the hill foot, but fruiting and subsequent maturing of the berries has proved irregular.

Truck Garden Crops.

149. An important feature of the Department's policy has been the encouragement of more widespread cultivation of truck or market garden crops. The prosecution of this policy has seemed all the more justified from the point of view of improved nutrition and from the increase in income which many of the farmers, who are suitably located, might secure from the cultivation of crops such as onions, tomatoes, cabbages, cauliflowers, lettuce, carrots, beet, bouldangers, ochroes, squash, salad beans, etc.

150. A limiting factor in the production of these crops is situation. First, the grower must have available a soil of the light type, which is not widespread, and a liberal supply of farm manure must be obtainable. An adequate water supply for use in dry weather is a necessity. In localities which have provided these facilities the Department has made a determined effort with demonstrations, competitions, distribution of seed and seedlings and practical instruction. Although the objects in view have not been, generally speaking, fully realized, yet it cannot be questioned that material progress with the cultivation and extension of these crops has taken place within recent years. This work has also assumed importance in connection with school and home garden projects.

151. Space does not permit a review of the results with the numerous crops which fall into this group, but full cultural recommendations including results of variety trials, have been published and distributed to farmers, school teachers and all interested.

Plant and Seed Introduction.

152. The following list—grouped under the various heads—gives an indication of some of the more important introductions of economic plant material (exclusive of sugar-cane and rice) which have been made since the re-organisation of the Department.

FRUIT.

Citrus.—

Oranges. —18 varieties introduced from Trinidad, United States of America and Surinam.

Grapefruit.— 7 varieties introduced from Trinidad, Dominica and United States of America.

Tangelos. — 8 varieties introduced from Trinidad and United States of America.

Other Citrus.— 6 varieties introduced from Trinidad, Dominica, St. Lucia, Surinam and United States of America.

Mangoes. . —19 varieties introduced from Trinidad, Dominica, St. Lucia, Jamaica, Puerto Rico and United States of America.

Avocado Pears.—10 varieties introduced from Trinidad and St. Lucia.

Pineapples. — 9 varieties introduced from Trinidad, Grenada, Hawaii, Honolulu, Puerto Rico, Federated Malay States and Brazil.

Bananas. — 4 varieties introduced from Trinidad.

Papaw. 11 varieties introduced from Trinidad, British Honduras, Montserrat, Mauritius, Panama Canal and Queensland.

- Pomegranate. — 5 varieties introduced from Palestine.
 Other Fruit. —24 varieties introduced from Dominica, Venezuela, United States of America, Trinidad, Australia, Jamaica and Africa.

TRUCK GARDEN CROPS.

- Peas and Beans.—52 varieties introduced from the United States of America, United Kingdom, Australia, Trinidad, St. Vincent, Jamaica, Martinique, Puerto Rico, India, Nigeria, Uganda and South Africa.
 Cauliflower. — 5 varieties from India.
 Cabbage. —20 varieties from United States of America and United Kingdom.
 Cucumber. —19 varieties from United States of America and United Kingdom.
 Carrot. —10 varieties from United States of America and United Kingdom.
 Celery. — 7 varieties from United States of America and United Kingdom.
 Beet. —14 varieties from United States of America and United Kingdom.
 Egg Plant. —10 varieties from United States of America and United Kingdom.
 Lettuce. —17 varieties from United States of America and United Kingdom.
 Onion. —13 varieties introduced from United Kingdom, Montserrat, St. Vincent, Teneriffe, Egypt and India.
 Ochroes. — 7 varieties introduced from the United States of America and Barbados.
 Radish. —18 varieties introduced from United States of America and United Kingdom.
 Tomatoes. —26 varieties introduced from United States of America, United Kingdom, Canada and Guernsey, Channel Islands.
 Other Truck Crops.—37 varieties introduced from United States of America, United Kingdom, Trinidad, Barbados, India.

PROVISION CROPS.

- Yams. —10 varieties introduced from Trinidad, St. Lucia, Dominica and Barbados.
 Sweet Potatoes.—13 varieties introduced from Trinidad, Barbados and Russia.
 Cassava. — 4 varieties introduced from Guadeloupe and Philippines.
 Eddoes. — 2 varieties introduced from Barbados.
 Maize. —13 varieties introduced from United Kingdom, United States of America, Canada, Puerto Rico, Calcutta and Imperial College, Trinidad.
 Ground Nuts. — 5 varieties introduced from Gambia, India and the United States of America.

OIL PRODUCING PLANTS.

- Oil Palms. —Selected varieties from Dutch East Indies and Nigeria.
 Tung Oil. — 3 varieties introduced from Kew, United States of America, Trinidad, Honduras and Queensland.
 Citronella. — 1 variety from Ceylon.
 Soya Beans. — 7 varieties from Trinidad, China, Canada and United States of America.
 Dwarf
 Coconuts. — 3 varieties from St. Lucia.
 Chalmoogra. — 1 variety from United States of America.

SPICES AND MEDICINAL PLANTS.

- Black Pepper. — 4 varieties from India.
 Chilli Pepper. —15 varieties introduced from Ceylon, India, Mexico, Canada and Palestine.
 Ginger and
 Turmeric.—Several varieties introduced from Ceylon, Dominica, Jamaica and Trinidad.

Cinchona	
(Quinine).—	2 varieties from India.
Cinnamon.	— 1 variety from East Africa, Ceylon and Gold Coast.
Camphor.	— 2 varieties from East Africa and Gold Coast.
Nutmeg.	— 1 variety from Trinidad and St. Vincent.
Cola.	— 1 variety from Trinidad.
Tonka Bean.	— 1 variety introduced from Trinidad.
Guarana.	— 1 variety introduced from Kew.

MISCELLANEOUS.

Coffee.	— 4 varieties introduced from Trinidad, Dominica and Tanganyika.
Tobacco.	— 14 varieties introduced from Trinidad, United States of America and Canada.
Forage Plants, Green Manures and Cover Crops.	— 44 varieties from United States of America, Pretoria, Natal, Nyasaland, Hawaii, Cyprus, Egypt, Tasmania, Trinidad, Kew, Jamaica and India.
Fibres.	— 2 varieties from St. Vincent and Trinidad.
Insecticidal Plants.	— 3 varieties introduced from Puerto Rico and Malaya.
Wheat.	— 4 varieties from Nairobi, East Africa.

III.—AGRICULTURAL EDUCATION.

Rural Science and Elementary Agricultural Courses.

153. With a view to providing an agricultural bias in the primary education of this Colony to which reference is made in previous reports, sixteen school teachers were once more selected by the Director of Education to attend the Rural Science and Elementary Agricultural Courses given under the aegis of the Department. A member of the Department of Education was in general charge of the teachers and the lectures were delivered by members of the Department of Agriculture, for which purpose the Girl Guides' Pavilion was used. Practical work was carried out at the Botanic Gardens and adjoining Experiment Stations, and a model school garden was laid out, in which each teacher was responsible for his own plot. Two prizes for the best gardens were given by the Department, the winners being H. C. Scarder and A. R. Wade. A test was held half way through the course and an examination at the completion of it. Certificates signed by the Director were issued to the successful candidates.

School Gardens.

154. There are now twenty-six school gardens registered by the Department, which are situated as follows :—Georgetown, one ; East Coast, Demerara, four ; West Coast, Demerara, three ; West Bank, Demerara, two ; West Coast, Berbice, three ; Corentyne, six ; East Bank, Berbice, one ; Essequibo, three ; Wakenaam, two. The work forms part of the schools' daily curriculum, while the agricultural officers visit the gardens regularly giving advice and criticism where required. In this connection, thirty-two selected school teachers have been detailed to attend the two Rural Science and Elementary Agricultural Courses held under the aegis of this Department, and twenty-nine of these are available for carrying out the scheme. Owing, however, to various limitations it was not found possible during the school year 1936-1937 to utilise the services of all these teachers in the manner required by the scheme. To meet this contingency supplementary provision has been sought by the Education Department.

155. Seed obtained from Messrs. Sutton & Sons, Reading, England, and Messrs. Peter Henderson, U.S.A., has been distributed free to all gardens. On the whole, considering the difficulties to be faced, fair progress is being made.

Encouragement has also been given to various unaided school gardens by way of free distribution of seed, and the District Officers have visited and given instructions whenever possible. Home gardens have also been fostered and assisted in every way.

Field Days.

156. Continuing the practice last year, three field days were held at the Sophia Sugar Experiment Station on August 30, September 6 and 13, and were attended by members of the Sugar Estates' staffs. The Director, Sugar Agronomist, Chemist and Field Manager gave short talks on various aspects of the sugar research work being carried out. These field days were well attended and appreciation was expressed of the arrangements made and the opportunity given for discussion of points of mutual interest.

157. A Farmers' Field Day was held in the Botanic Gardens on September 20, and was well attended. The visitors were conducted through the Sugar Experiment Station, the Rice Station, the Livestock Farm, the Apiary and the Nurseries. The Director of Agriculture welcomed the farmers on their arrival and officers of the Department were in attendance throughout the day.

Agricultural Exhibition.

158. An Agricultural Exhibition planned for Berbice has had to be postponed owing to unfavourable weather conditions. A considerable amount of propaganda work was carried out, and prize lists printed and distributed.

B.—THE RESEARCH BRANCH.

Sugar.

159. The following members formed the Sugar Experiment Stations' Committee for the year:—

Director of Agriculture	...	...	Chairman.
Mr. J. C. Gibson	...	...	Pln. Port Mourant.
Hon. M. B. G. Austin	...	...	Messrs. Curtis Campbell & Co., Ltd.
Mr. A. Murison	...	...	Pln. Uitvlugt.
Mr. J. Bee	...	...	Pln. Albion.
Mr. K. E. Rhodes	...	...	Pln. Diamond.
Mr. G. M. Eccles	...	...	Pln. Blairmont.
	with		
Mr. C. L. C. Bourne	...	...	Secretary to the Committee.

160. During the absences from the Colony of the substantive members of the Committee

Hon. F. J. Seaford	acted for	Hon. M. B. G. Austin
Mr. W. H. Richards	„ „	Mr. J. C. Gibson
Mr. L. Lywood	„ „	Mr. R. E. Rhodes, and
Mr. G. Gleadow	„ „	Mr. A. Murison.

161. One Barbados, two Canal Point (Florida), two Florida and three Indian seedlings were imported during the year *via* the Central West Indian Quarantine Station at Trinidad. Most imported canes fail under local conditions, but such outstanding exceptions as P.O.J. 2878 and Co. 213, as well as considerations in regard to the breeding work, make continued importations an essential feature of the work.

162. All the canes bred prior to 1921 have been eliminated and only nine of those produced prior to 1930 remain to be definitely evaluated. With the exception of three seedlings, all the 1930, 1931, 1932 and 1933 varieties which survived the preliminary eliminations are already in replicated tests. In the case of the 1930 batch, several of the experiments have now reached the second ratoon stage. The 1935 seedlings have undergone their second selections. This batch is of particular

interest in being the first of which a proportion of the seedlings were grown and selected on pegasse soil. On the frontland clay, at Sophia, the most successful parents were:—

M.P.R. 7 x D. 66/30	P.O.J. 2878 x D. 66/30
M.P.R. 7 x Diamond 10	P.O.J. 2878 x D. 2/31
D. 10/30 x Diamond 10.	

On the pegasse at Pln. Uitvlugt there was some indication that D. 49/30 x Diamond 10, B. 6835 x D. 66/30, D. 602/22 x Diamond 10 and D. 13/30 x Diamond 10 would prove promising parents for this soil type.

163. The 1936 seedlings have been subjected to their first selection. The outstanding parents on the frontland soil at Sophia were:—

P.O.J. 2753 x Co. 213	M.P.R. 151 x D. 53/33
P.O.J. 2878 x Co. 213 and	M.P.R. 151 x D. 46/33.

On the pegasse at Leonora, where a particularly fine selection of first-year seedlings was obtained, the most successful crosses were:—

D. 49/30 x Diamond 10	D. 182/30 x Diamond 10
D. 450/33 x D. 38/33	N.G. 251 x Diamond 10
M.P.R. 145 x Diamond 10 and	D. 602/22 x Diamond 10.

164. The 1937 seedlings have not all been basketed at the time of writing and will have to be discussed in a subsequent report. The season was, on the whole, unfavourable for cane-breeding, but a large number of seedlings was nevertheless secured, though the number would doubtless have been still larger under more favourable circumstances. Stale filter-press cake was tried as a growing medium in the germinating boxes. It was found that germination and early growth were very satisfactory, but subsequently chlorotic symptoms appeared and the mortality was high.

165. In the variety trials, of which 68 were reaped during the year, P.O.J. 2878 and Diamond 10 continue to outyield most competitors. Co. 213 is still very promising and more extensive commercial plantings are advised. Some of the 1930 seedlings are maintaining their early promise and commercial extensions of D. 49/30, D. 66/30, etc., are being made on the estates. Several of the 1933 seedlings have given excellent plant cane results in the experiments.

166. Thirty manurial trials were harvested during the year. The question of nitrogen requirements has been carried a step further and it is now possible to offer definite advice to cover an entire cycle, viz. 2 cwt. sulphate of ammonia per acre for the plants and 4 cwt. per acre for each of the three succeeding ratoon crops.

167. Tests with other sources of nitrogen than sulphate of ammonia have given interesting results. Nicifos (18:18) has proved particularly efficient where phosphates are deficient, and there are signs that nitro-chalk and nitrate of soda will be equally as efficient (lb. per lb. of nitrogen) as sulphate of ammonia. If this is confirmed they merit careful consideration for while, owing to a lower nitrogen content, they may be slightly more expensive, the increase in soil acidity in this Colony, due to continuous heavy applications of sulphate of ammonia, has been found to be very marked over even a comparatively short period of years, and not to be offset by a period of flood fallow; as the sugar cane soils are already very acid every effort should be made to prevent the pH reaching the limit of cane growth.

168. The results of the various trials and work on manures, etc. are published regularly in the Sugar Bulletins, of which No. 7 is the most recent.

Rice.

169. As anticipated, the breeding programme and selection work on existing padi varieties had a temporary setback owing to the resignation of the Plant Breeder in 1936. With the appointment of the Assistant Plant Breeder, both intensive

hybridisation and selection work were started once again. High-yielding varieties which came to be forefront during the year were, D114, D110, D99, varieties of medium length grain, together with D91 and D221, which are long-grained. The total number of varieties tested at the Georgetown Experiment Station, including imported varieties and selections from local cultivations, was 226. Twenty-two successful crosses were made, and the first generation planted out.

170. In the Essequibo district selection was also carried out among the cultivations in the search for a long-grained, easy-threshing variety to replace the Blue Stick variety which has long been under cultivation there. Altogether, 52 varieties and strains were under observation at the Henrietta Experiment Station.

171. During the year, fourteen variety padi trials were laid down, six being standard trials with the same varieties, the remaining eight trials containing new varieties for comparison with Demerara Creole, No. 79, or Blue Stick as controls. The sites of these experiments were:—

Berbice	...	...Whim Experiment Station. No. 63, Corentyne. Pln. Bath, West Coast.
Demerara	...	...Georgetown Experiment Station. Hope, East Bank. Vreed-en-Hoop, West Bank.
Essequibo	...	...Henrietta Experiment Station. Leguan. Wakenaam.

172. Substantial progress has been made in further selection work with the standard varieties Demerara Creole, No. 79 and Blue Stick. Demerara Creole continues to be popular in some districts as a long grain variety of the Patna type, but it has certain defects both in the field and at the mill which it does not seem possible to remove entirely by selection. Its yields tend to vary a great deal, depending on conditions; it lodges readily with heavy rain or wind; it is not easy to thresh except by machine, and the grain has a slight curve resulting in considerable breakage during the milling process. It does not turn out as bright a sample of milled rice as varieties like No. 79, Blue Stick and some of the newer selections, but its cooking qualities are excellent and this accounts for much of its popularity. Demerara Creole gives best results in districts with favourable field conditions and adequate water supply.

173. The variety No. 79, a medium length grain, which has been brought to a high state of perfection by selection, is an excellent variety in the field, standing up well to adverse conditions especially in regard to water supply, and in addition is favoured by the mills, the finished product being similar to Blue Stick. It leads other varieties as regards yield in those districts to which it is adapted. It does not thresh readily and is popular wherever this operation is done by bulls.

174. Blue Stick, a medium length grain, is an old variety which is still favoured on the Essequibo Coast. Some of the newer strains which have been selected are showing improved yielding ability but one of the disadvantages of Blue Stick is a tendency to uneven ripening; there is a great deal of shattering in the field before harvesting begins, that is, the older matured grains fall from the stalk before the later maturing grains are fully developed. It is easy to thresh, however, and the mills have no difficulty in producing a high quality rice from it. On some estates in Essequibo which have built up a reputation for high grade rices and which encourage the practice of hand-threshing, it is very popular. In no other area, however, is the yield high enough to justify its extension.

175. Of the newer varieties, reference has already been made to those which have shown up recently, including long grain varieties for which there appears to be a demand at present, and which has influenced very considerably much of the more

recent work of the Department. Generally speaking, however, these long grain varieties do not equal in yield the better medium length varieties and, since yield is a most important factor with cultivators, those millers who are anxious to extend long grain varieties may have to pay a little more for padi to encourage their extended cultivation.

176. In addition to the variety work, investigations are still being carried out in respect to planting practices, involving dates of seedling and transplanting, planting distances, seedlings per hole, manures and fertilisers.

177. The work of testing the milling and associated qualities of the various varieties under trial is being greatly facilitated by the acquisition of a Universale mill obtained from Italy. It is now possible to examine rapidly and efficiently a large number of samples as to their suitability for the manufacture of parboiled rice, milling outturn and related factors. This is an exceedingly useful piece of equipment which, in time, might be adopted by millers who wish to buy padi on grade. Visitors would be welcomed to the Chemistry Division where this mill has been installed and where demonstrations can be given. It will also enable studies to be made on the characteristics or peculiarities of paddies and enable recommendations to be made in regard to the milling of some varieties which, although worthy of retention on account of high-yielding ability, might be rejected by millers who have not the time nor the facilities for study of special problems. In this connection, for example, an outstanding variety at the present time and one which has given exceptional yields in all districts is D. 114. Some millers have reported difficulty in the elimination of a white streak which frequently appears in samples of the milled rice and which detracts somewhat from the appearance of the finished product. Information is now available in respect to the treatment necessary for the elimination of this character and which can easily be done in the processing.

178. Enquiries have also been made in regard to the rapid removal of discoloured grains by an electrical apparatus and, if this is found to be practical, a great step forward could be made in the cleaning up of rice in bulk and thereby enhancing its general appearance for the trade.

179. Further particulars of the rice research work will be obtained from the Divisional Reports, published separately, and the Agricultural Journal, in which latter a summary of the results obtained is given.

180. Earlier reference has been made to the district work of the Department in connection with rice and it is pleasing to note that the favourable reaction of cultivators to the advice and assistance given by the District Officers is becoming more and more marked. It is not realised how much detailed work is involved in the laying down of trials and demonstrations, the attention necessary to roguing and maintenance of purity, and the individual contacts necessary with millers and farmers generally in order to ensure that there is no drift backwards in the matter of seed supplies. It is so easy, for example, for cultivators to lose heart and be discouraged by low prices and unfavourable weather conditions both of which have prevailed during recent years. It is safe to say, however, that in spite of all the difficulties which have been encountered the Colony to-day is more rice-minded than at any time in the past, and if the work and efforts of the Department both in respect to research and extension have contributed in some way to that result, then the time and trouble expended have not been in vain.

Fish Poisons.

181. Shortly before the re-organisation of the Department, the possible value of the fish poison plants of the Colony as insecticides had been realised, and a selection of them was sent to Rothamsted for analysis. As a result, it was learnt that the only varieties of any promise, were the Black and White Haiares, which at that time were known as *Lonchocarpus* spp., and *Yarroconalli* (*Tephrosia toxicaria*).

182. Cultivation of this latter on a large scale proved to be difficult, but the Haiaris seemed to hold promise, and in 1929 two four-acre blocks were put down in the North West District, one at Hosororo on laterite, and the other at Sub-station Wauna, on grey sand. Half of the plants at each station were grown in the open, and half in a forest area in which the underbush had been cutlassed. Although the plants under shade made slow progress, those in the open grew rapidly, especially on the sandy soil at Wauna.

183. In 1935 the White Haiari at Wauna flowered and was identified at Kew as *Lonchocarpus nicou*, whereby it appeared to be conspecific with the *Cubé* and *Barbasco* of the Amazon basin. Analysis, however, showed that the young Haiaris from the experimental plots did not contain more than 1-2 per cent. of rotenone.

184. In 1937, two American botanists, Drs. Smith and Krukoff, who had had considerable experience with the South American fish poison plants in general, made a detailed study of the different species and varieties of *Lonchocarpus* used for this purpose. As a result of their researches they found that Black and White Haiari were two separate species of *Lonchocarpus*, namely *L. chrysophyllus* and *L. Martynii*, and were quite distinct from the species known as *Cubé* and *Barbasco*, of the Amazon basin, which accounted for the difference in rotenone content.

185. It is possible, however, that constituents of these insecticidal plants other than rotenone, may prove of value, and the chemical methods of evaluating these are at present the subject of research at Rothamsted, the results of which it is hoped may indicate further lines for profitable experimentation on the indigenous fish poison plants. In the meantime, a living collection of these plants has been got together in the Botanic Gardens and augmented by the introduction of *Derris elliptica* and *Tephrosia vogelii* recently obtained from Puerto Rico.

I.—DIVISION OF BOTANY PLANT PATHOLOGY.

186. The Botanist and Plant Pathologist was granted four and a half months leave of absence in the United Kingdom, during which period he attended the Fourth International Grassland Conference as the Colony's representative.

Banana Leaf Spot and other Diseases.

187. The most serious disease that concerned the Division was *Cercospora* leaf spot of bananas, bad outbreaks of which occurred in August on the Department's five acre experimental plots of Gros Michel bananas on the East and West Banks of the Demerara River. Not much could be done during the year under review beyond diagnosis of the disease and the recording of its spread, but arrangements were made to carry out spraying experiments in anticipation of outbreaks in the next wet season, and to test the efficacy and economics under local conditions of this method of control, which is generally recommended to combat the disease. In addition to this, the usual advice and assistance was rendered with regard to the commonly occurring diseases of fruit trees, vegetables and garden plants.

Fish Poisons.

188. The work of Krukoff and Smith on the rotenone yielding plants of South America, already referred to in paragraph 184, was of great assistance in clearing up the systematic position of these two species which have engaged the attention of the Division for some years.

Herbarium.

189. A typescript index of the indigenous Phanerogams in the Jenman Herbarium was completed and copies sent to the Herbariums of Kew, the New York Botanical Gardens and Utrecht. These should prove of value to systematists studying the Floras of the Guianas and the neighbouring regions of South America.

II.—DIVISION OF CHEMISTRY.

190. Mr. R. R. Follett-Smith, B.Sc., A.R.C.S., resigned his post on June 13 in order to take up an appointment as Consulting Chemist to a group of sugar firms. Mr. C. L. C. Bourne acted as Chemist until Dr. D. W. Duthie, M.A., B.Sc., F.I.C. assumed duty on August 7.

191. During the past few years this Division has received assistance for staff and equipment, from the Colonial Development Fund, the Imperial Chemical Industries and Messrs Booker Bros. McConnell & Co. Ltd. All these grants have now been withdrawn and the Divisional programme has been altered to fit the changed conditions. Latterly, much of Mr. Follett-Smith's work was concerned with a soil survey of the sugar cane areas of the Colony, with manurial trials in collaboration with the Sugar Agronomist and with chemical control in the sugar factories. Since much of the advisory work on sugar cane soils and on factory control will still be carried out by Mr. Follett-Smith, the work of the Division will now be concerned with the investigation of fundamental problems of sugar cane soils, among which is the important one of soil acidity, in addition to the more general work on other crops.

Manurial Trials.

192. *Sugar*.—It has been shown repeatedly in various annual reports of the Division that the continued application of sulphate of ammonia alone has a definite acidifying effect on soil. This is partly, at least, counteracted by the practice of flood fallowing, but it is an undoubted fact that the cultivated clay soils of the Colony are gradually becoming more acid. The comparatively high cost of limestone, coupled with the lack of economic response to liming in manurial trials, render it advisable to investigate the problem before a stage is reached when the yield is affected. The Sugar Agronomist is carrying out field trials with non-acidifying manures, and further soil studies will be carried out by the Chemical Division.

193. *Rice*.—The research work on rice which has been carried out during the past eight years is being continued as far as circumstances permit. It consists of manurial trials, soil studies and investigation of methods of parboiling, drying and milling. A small experimental mill has been purchased, and small samples (100 gm.) of padi can now be milled under standard conditions.

Fish Poisons.

194. Work on Haiaris has been greatly affected by the discovery that "White" Haiari is not conspecific with Cubé. The chemical methods of evaluation of insecticidal plants are being investigated by Dr. Tattersfield at Rothamsted, and further work will be carried out when these methods have been standardised. Meanwhile, a growing collection of fish poison plants is being established at the Botanic Gardens. Material for analysis and experimentation will thus be available when the time is opportune for further work.

Sugar Experiment Station.

195. The laboratory of the Sugar Experiment Station, Sophia, is supervised by the Chemist and Assistant Chemist and the work consists of the crushing and analysis of samples of cane from experimental plots. The measurements made are sucrose per cent. cane, juice purity and glucose ratio. During the year under review 3,721 samples were examined, the average sample weight being 27 lb. 471 field refractometer readings were also carried out by the laboratory staff. The results are included in the annual sugar bulletins.

III.—DIVISION OF ENTOMOLOGY.

Amazon Fly.

196. During the year a status survey of the Amazon Fly, *Metagonistylum minense* Towns. was carried out. A total of fifteen estates was included in the examination extending from Plantation Skeldon on the extreme east of the Colony to Plantation Versailles and Schoon Ord on the West Bank, Demerara River. On

the fifteen estates a total of 212 fields was examined and in 73 per cent. of these the Amazon fly was found parasitizing *Diatraea*. In these examinations some 30,332 "deadhearts" were cut out, of which 56.3 were empty and 5.5 per cent. were the result of "other causes" including white grubs (hardback beetles) and rats. In the remainder *Diatraea* were present in the proportion of 43.9 per cent. *D. saccharalis* and 56.1 per cent. *D. canella*. Of the *D. saccharalis* population in "Positive Fields" 16.0 per cent. were parasitized by the Amazon fly ("Current Positive Parasitism") but if all fields, both positive and negative, are considered, the parasitism was 13.7 per cent. of the *D. saccharalis* population. A full account of this survey has been published in a recent number of the Agricultural Journal.

Pests.

197. *Rice*.—There were no serious outbreaks of insects affecting rice during the year.

198. *Coconuts*.—Outbreaks of the coconut caterpillar, *Brassolis sophorae* L. occurred both in Georgetown and New Amsterdam and clean-up campaigns were carried out in both these places. It is gratifying to report that in these outbreaks both in Georgetown and in New Amsterdam, the owners of palms in most instances responded readily and the work was executed in a manner hitherto not obtained. The few individuals who refused to carry out the control measures were served with notices under the Plant Diseases and Pests (Prevention) Ordinance and thereafter complied. The clean-up campaigns which were undertaken in these instances involved the visiting and supervision of control work in 475 premises in Georgetown and 309 in New Amsterdam, involving a total of 2,192 palms. This work occupied the whole time of the laboratory assistants for a total period of just under three months of the year.

199. On the Upper East Coast there were a few small outbreaks but no serious damage was caused.

200. *Rats*.—The outbreak of rats in Berbice reported last year continued and received attention. Extensive trials with poison baits were undertaken in conjunction with the estate authorities, in which most of the well-known baits were tried, besides a number of others that appeared might be especially suitable for the particular rodent. It is proposed to publish an account of this outbreak in the near future.

Visitors.

201. Dr. K. A. Bartlett of the United States Department of Agriculture, Puerto Rico Experiment Station, visited the Colony in September for the purpose of obtaining supplies of Amazon fly. While here, Dr. Bartlett visited a few of the larger sugar estates and was accompanied by the Entomologist on these visits.

202. Dr. O. W. Richards, Mrs. Richards and Dr. John Smart, who formed a British Museum expedition to the Colony in August, visited the laboratory.

C.—LIVESTOCK BRANCH.

203. A free grant from the Colonial Development Fund was made during the year for the importation of pure bred stock and for extension of the existing unit at the Stock Farm, *vide* paragraph 58. Accordingly two new stables have been built to accommodate the consignment of cattle ordered from Messrs. John, Thornton Hobson & Co., through the Crown Agents for the Colonies, and which arrived in the Colony in the early part of 1938, while three vats for a clean water supply have been erected and the food and straw barns have been extended.

204. In order to carry out the new policy of agisting female cattle for breeding purposes, and with a view to pasture improvement, the farm has been re-planned. The pig and poultry sections have been moved to new sites and each is now self-contained and separate from the cattle areas. All the land has been drained, cleared of bush, and divided into twelve paddocks. Roads for easy access to all

paddocks, and bridges across the main trenches, have been built. Shade trees have been planted and the area under forage crops increased. In this connection, a quantity of slips of *Indigofera endecaphylla* and Demerara Primrose and also Teosinte seed have been distributed to farmers, but there is little demand for forage plants.

205. The Holstein-Friesian bull and five Holstein-Creole heifers have been transferred from Mazaruni to Georgetown. The Leguan Station was continued with one Guernsey bull and two pens of poultry while a new station was started at Kitty, East Coast, Demerara, with one Holstein-Friesian bull.

206. The distribution of animals on December 31, 1937, was as follows:—

Georgetown:—

Holstein-Friesian bulls	...	3
Red Poll bull	...	1
Guernsey bulls	...	2
Guernsey bull calf	...	1
Holstein-Friesian cows	...	2
" " heifer-calf	...	1
Creole cow	...	1
" heifers	...	2
Holstein-creole heifers	...	5
" " bull calf	...	1
Canadian-Berkshire boars	...	3
" " sows	...	2
" " gilts	...	6
Kentucky Jack	...	1
Colts	...	2
Working Donkeys	...	2
Rhode Island Red—Pens	...	2
Barred Rock—Pens	...	2
Ducks—pens	...	3

Leguan Breeding Station:—

Guernsey bull	...	1
Rhode Island Red—Pens	...	2

Kitty Breeding Station:—

Holstein-Friesian bull	...	1
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Services by the bulls for the year were 378 and by the Jack Donkey 25.

D.—AGRICULTURAL ECONOMICS, STATISTICS AND PUBLICATIONS BRANCH.

207. Previous reports have made reference to studies carried out by the Economics Division in regard to agricultural credit, seasonal variation in prices and exports, index prices of the Colony's chief import and export commodities and prices and imports of agricultural fertilisers. During the year a report was published on the first important economic survey completed in the Colony. This survey—"An Economic Survey of Farming in East Demerara"—was a study mainly of the factors affecting profits in the largest cane-farming area of the Colony. Towards the end of the year the Secretary of State for the Colonies gave his approval for an extended programme of investigation, by means of economic surveys, of other important farming areas of the Colony.

208. A study was also made of the seasonal variation on arrival at market of most of the important minor agricultural products. An article on the subject—"The Marketing of Minor Crops"—was published.

209. The system of recording weekly the prices of locally grown products has been maintained with a regular despatch by telegram to outlying districts. London quotations for the Colony's chief export products are reduced weekly to an f.o.b. Georgetown basis and submitted for Government's information.

Publications.

210. The Agricultural Journal of British Guiana continued to appear. The third number of Volume VIII was devoted entirely to agricultural economics. Officers of the Research and Field Branches continued to contribute articles to the various numbers; these are noted in detail in the Divisional Reports published separately.

211. The Farm Journal, which was in its second year, continued to meet a useful need, being issued for the benefit of the small farmer in order to provide in simple language information of value and interest to him and his home circle.

212. Sugar Bulletin No. 6 was published during the year. In addition to the above, a note on the subject of "Rainfall and Moon Phases" by C. H. B. Williams, appeared in "Nature", February 6, 1937, while two articles entitled "A Portable Scale for experimental work" by C. H. B. Williams, and "The Boring Points for Refractometer Tests of Sugar Cane" by C. Cameron and H. B. Singh, appeared in "Tropical Agriculture" in March and November, respectively.

Library.

213. Additions during the year included 27 new books, 115 periodicals purchased or received in exchange and a large number of bulletins.

214. Considerable improvements were effected in the Library itself, loose-leaf binding continued and careful indexing was maintained, while practically all of the books and periodicals have now been placed under glass, affording greater protection from insects.

E.—CO-OPERATIVE CREDIT BANKS' BRANCH.

215. The Credit Banks, which operate under the provisions of Ordinance No. 28 of 1933, continued under the Chairmanship of the District Agricultural Officers, while the Registrar and Auditor is attached to Headquarters staff. The Director of Agriculture is the Chairman of the Co-operative Credit Banks' Board and the Registrar is Secretary.

216. There were on December 31, 1937, twenty-seven banks on the register. Towards the close of the year, however, seven of these were ordered into liquidation.

217. At the close of the year the membership of the twenty functioning banks was 8,786; West Indians owned 38,937 shares and East Indians 20,914 out of a total issue of 64,593.

218. The lending capital of the banks is derived from two main sources—share capital subscribed by members and Government loans.

219. The total borrowed from Government is \$67,363.00 and at December 31, 1937, the balance owing was \$15,457.84.

220. Loans are made by the Credit Banks to members only and these are chiefly small agriculturists with valid security, raising crops of padi, sugar-cane, ground-provisions, etc. Some business is also done with persons engaged in coconut oil manufacture, pig-keeping, huckstering, diamond seeking, etc. Money is also lent for repair of buildings and for purchase of properties.

221. In the following table a comparison of the business done in 1936 and 1937 by all the banks in the Colony is made :—

Year.			Number of Loans.	Amount Lent.	Loans Recovered.	Interest Collected.
1936	...	...	1,269	\$ 36,320 29	\$ 35,076 28	\$ 10,192 57
1937	...	...	1,018	30,962 34	30,359 24	7,884 15
	Decrease	...	251	\$ 5,357 95	\$ 4,717 04	\$ 2,308 42

222. By an amendment of the Rules during the year, the provision for building up a Reserve Fund out of profits is now fixed at 4 per cent. per annum until it equals one-third and thereafter at 2 per cent. per annum until it equals two-thirds of the paid-up capital of a Bank. The total amount of investments carried by the banks in this connection at December 31, 1937, was \$30,348.45 and, in addition, \$810.69 was further allocated by the various banks for 1937 to be invested later. There is also a Secretaries' Guarantee Fund in connection with the banks which stood at \$3,747.18 at the end of 1937.

SECTION III.

ADVISORY BOARD OF AGRICULTURE.

223. The Advisory Board of Agriculture which is constituted by Ordinance No. 26 of 1934 comprised the following :—

Director of Agriculture, Chairman, <i>ex-officio</i> .		
Deputy Director of Agriculture, Vice-Chairman, <i>ex-officio</i> .		
Hon. R. E. Brassington,		
„ F. J. Seaford, O.B.E.,	}	Members.
„ Peer Bacchus,		
„ J. W. Jackson,		
Mr. W. H. Richards,		
„ R. B. Hunter,		
„ S. Andries,		
with		
Capt. J. F. Irving, M.C.,	...	Secretary.

224. Five meetings of the Board were held during the year. Among the more important matters dealt with were :—

- (1) Proposals for the formation of an export trade in plantains to Trinidad to which full reference has already been made. In this connection the Board prepared and submitted to Government a memorandum on the control of the trade, with a proposed bill, based on similar lines to the Trinidad Banana (Control) Ordinance.
- (2) Reports on trial shipments of grapefruits to the United Kingdom.
- (3) Trial shipments of green limes and lime juice to Canada.
- (4) Possibility of local lime oil producers joining the West Indian Lime Oil Sales Company, Limited and the formation of co-operative marketing organisations affiliated to this Company.
- (5) Establishment of an agistment area at La Belle Alliance.
- (6) Berbice County Agricultural Exhibition.
- (7) Establishment of a preserve industry, more especially with guava products.
- (8) Outbreak of disease at the banana experimental plots at Middlesex and Supply.
- (9) Importation of British Guiana coffee into St. Vincent.
- (10) Trials with flue-curing of tobacco.
- (11) Draft cattle branding bill.
- (12) Preparation of cane-farmers' register.
- (13) 1938 Estimates, Department of Agriculture.

SECTION IV.

FINANCIAL STATEMENT.

225. The total vote assigned to the Department of Agriculture by the Legislature at its Session for the year was \$118,861. The following expenditure was voted on Supplementary Estimates during the year :—

Excesses to be met
from savings on
other sub-heads.

Other Charges :—

2. Transport and Travelling ...	\$353 29	
4. Scientific Apparatus and Equipment ...	400 00	
6. Government Gardens and Grounds ...	4 66	
7. Purchase, Production and Distribution of Seeds and Plants ...	41 50	
21. Miscellaneous ...	25 77	
25. Dr. D. W. Duthie's passage to B.G. from Trinidad ...	21 00	
26. Passage of Mr. C. L. C. Bourne from Barbados	44 00	\$890 22

TABLE XVII.

BALANCES UNEXPENDED AND EXCESS EXPENDITURE — 1937.

No. of Sub-vote.	Sub-vote.	Balance Unexpended.	Excess Expenditure.
1 (1-17 18-26)	Personal Emoluments—Fixed ... do. —Unfixed ...	\$ 1,813 46 861 64	
	<i>Other Charges :—</i>		
2.	Transport and Travelling ...		\$ 351 29
3.	Library and Publications ...	31 29	
4.	Scientific Apparatus and Equipment ...	285 88	
5.	Botanic Gardens ...	52 95	
6.	Government Gardens and Grounds ...		4 66
7.	Purchase, Production and Distribution of Seeds and Plants ...		41 50
8.	Experiment Stations ...	91 07	
9.	Apiary ...	16 28	
10.	Livestock ...	250 89	
11.	Grants-in-aid of Agricultural Associations, Exhibitions and Competitions ...	670 50	
12.	Rice Grading Expenses ...	221 87	
13.	Training of Apprentices ...	32 46	
14.	Veterinary Preventive Measures ...	193 27	
15.	Plant Pests Preventive Measures ...	51 46	
16.	Soil Surveys ...	162 73	
17.	School Gardens ...	85 81	
18.	Experiments with Plants of Insecticidal Value ...	9 22	
19.	Experimental Farm Settlements ...	8 89	
20.	Maintenance of breeding centre and agistment area at La Belle Alliance ...	1,403 00	
21.	Experimental Banana Cultivation ...	4 29	
22.	Miscellaneous ...		25 77
	<i>Extraordinary Expenditure :—</i>		
23.	Electrical Anemometer ...	11 14	
24.	Amazon Fly Survey ...	196 83	
		\$ 6,454 98	\$ 425 22

226. The payments into the Treasury for the year were as follows :—

Agricultural Stations ...	\$ 2,094 55
Botanic Gardens ...	544 01
Veterinary Division ...	1,209 39
Sale of Official Publications ...	115 72
Rice Grading Samples, etc. *	7 00
Sundry Reimbursements ...	3,120 00
Miscellaneous ...	87 64

SECTION V.

SUMMARY OF AGRICULTURAL LEGISLATION ENACTED DURING 1937.

227. The following agricultural legislation was enacted during the year :—

Animals Diseases Regulations, 1937.—These regulations make it compulsory for animals to be inspected by a veterinary surgeon before export and to be shipped in suitably fitted vessels. A scale of fees chargeable for inspection was also fixed.

* Rice Grading Fees are collected by the Customs Department.

Order in Council (under Sections 12 and 13 of the Animals Diseases Ordinance, 1936).—This order declares the ports of entry and prescribes the terms and conditions for the importation of animals into the Colony.

Botanic Gardens Fine Fund (Amendment Regulations).—The effect of this was to amend the Principal Regulations in regard to expenditure from this Fund.

Order in Council under Section 3 of the Plant Diseases and Pests (Prevention) Ordinance, 1935.—The effect of this was to prohibit the importation of citrus material, including fruit, from the United States of America.

Importation of Cattle Foods.—Department of Agriculture Notice under Item 37 of Schedule 4 of the Customs Duties Ordinance of 1935 as enacted by Section 4 of the Customs Duties (Amendment) Ordinance, 1935. The effect of this was to make provision for the importation, free of duty, of certain cattle foods of high protein content approved by the Director of Agriculture.

Ordinance No. 19 of 1937.—This Ordinance was passed in connection with the restriction and regulation of sugar exports and to ensure that this Colony complied with the terms of the International Sugar Agreement. The chief features of this legislation were :

1. Each year's quota of sugar exports from the Colony shall be fixed by the Governor-in-Council with the approval of the Secretary of State.
2. The Governor-in-Council shall allocate the quota among the manufacturers and may at any time adjust such allocation.
3. The Comptroller of Customs will be empowered to issue to every manufacturer a licence to cover the amount which has been allocated for the quota year.
4. Exporters may then obtain certificates for each consignment up to the amount covered by the licence ; such certificate will be a valid authority for the manufacturer or any person whose name is endorsed thereon by the manufacturer to export the consignment of sugar to which the certificate relates.
5. The Governor-in-Council may limit the amount in stock held by any manufacturer on August 1 in each quota year.
6. The Governor-in-Council may require any person to submit a return giving accurate information in regard to stocks, sugar manufacture, etc.
7. The time at which sugar is placed on board ship for export or is taken across the frontier shall be deemed the time of exportation.

Order in Council under Section 3 of the Plant Diseases and Pests (Prevention) Ordinance, 1935.—These prescribe the conditions under which coffee may be imported into the Colony.

J. SYDNEY DASH,
Director of Agriculture.

July 15, 1938.

SUGAR EXPERIMENT STATIONS' COMMITTEE.

Director of Agriculture, Chairman, <i>ex officio</i>		
Hon. M. B. G. Austin, O.B.E.	...Georgetown	} Representing the Sugar Industry which maintains the Stations
Mr. G. M. Eccles	...Pln. Blairmont	
„ J. C. Gibson	... „ Port Mourant	
„ A. Murison	... „ Pln. Uitvlugt	
„ R. E. Rhodes	... „ Diamond	
„ J. Bee	... „ Albion	

CO-OPERATIVE CREDIT BANKS' BOARD.

Director of Agriculture, Chairman, <i>ex-officio</i>		
Dr. the Hon. J. B. Singh	...	} Members.
Rev. A. E. Dyett	...	
Mr. C. Farnum	...	
Mr. J. L. Wills	...	

DISTRICT AGRICULTURAL COMMITTEES.

EAST DEMERARA.

Director of Agriculture, Chairman.		
District Commissioner.		
Deputy Director of Agriculture	...	} Members.
Hon. J. I. D'Aguiar	...	
„ E. M. Walcott	...	
Mr. S. Andries	...	
„ M. Ghani	...	
„ W. H. Richards	...	
„ J. E. Wills	...	

WEST DEMERARA.

Director of Agriculture, Chairman.		
District Commissioner.		
Deputy Director of Agriculture.		
Hon. J. W. Jackson	...	} Members.
Dr. the Hon. J. B. Singh	...	
Mr. R. P. Carryl	...	
„ J. C. Da Silva	...	
„ R. B. Hunter	...	
„ A. Murison	...	
„ W. Ramdeholl	...	
„ A. Rayman	...	

